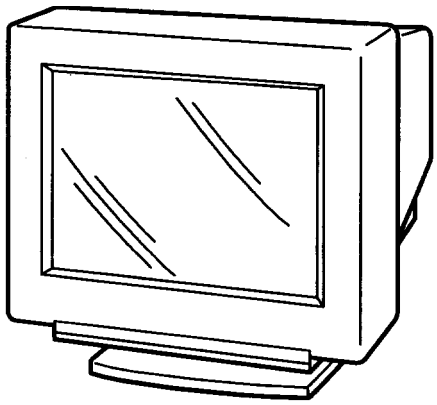
# GDM-20SE2T5

# SERVICE MANUAL

*AEP Model*

*Chassis No. SCC-J53D-A*



## N2H CHASSIS

### SPECIFICATIONS

| | |
|---|---|
| Picture tube | 0.25 mm aperture grille pitch<br>20 inches measured diagonally<br>90-degree deflection |
| Viewable image size | Approx. 387 × 292 mm (w/h)<br>(15 1/4 × 11 1/2 inches)<br>19.0" viewing image |
| Resolution | Horizontal: Max. 1600 dots<br>Vertical: Max. 1200 lines |
| Standard image area | Approx. 373 × 280 mm (w/h)<br>(14 3/4 × 11 1/8 inches)<br>or<br>Aprrox. 350 × 280 mm (w/h)<br>(13 7/8 × 11 1/8 inches) |
| Deflection frequency | Horizontal: 30 to 96 kHz<br>Vertical: 48 to 160 Hz |
| AC input voltage/current | 100 to 120 V, 50/60 Hz, 1.7 A<br>220 to 240 V, 50 – 60 Hz, 1.2 A |
| Power comsumption | Max. 150 W |
| Dimensions | 472 × 493.5 × 501 mm (w/h/d)<br>(18 5/8 × 19 1/2 × 19 3/4 inches) |
| Mass | Approx. 30 kg (66 lb 2 oz) |

Design and specifications are subject to change without notice.

MICROFILM

## TRINITRON® COLOR GRAPHIC DISPLAY

## SONY®

## TIMING SPECIFICATION

| PRIMARY MODE<br>MODE AT PRODUCTION | MODE1 | MODE2 | MODE3 | MODE4 | MODE5 | MODE6 | MODE7 | MODE8 | PRIMARY<br>MODE9 | MODE10 |
|---|---|---|---|---|---|---|---|---|---|---|
| RESOLUTION | 640 X 480 | 720 X 400 | 640 X 480 | 832 X 624 | 800 X 600 | 1024 X 768 | 1024 X 768 | 1152 X 870 | 1280 X 1024 | 1600 X 1200 |
| CLOCK | 25.175 MHz | 28.322 MHz | 36.000 MHz | 57.285 MHz | 56.250 MHz | 80.000 MHz | 94.500 MHz | 100.000 MHz | 157.500 MHz | 202.500 MHz |
| — HORIZONTAL — | | | | | | | | | | |
| H-FREQ | 31.469 kHz | 31.469 kHz | 43.269 kHz | 49.727 kHz | 53.674 kHz | 60.241 kHz | 68.677 kHz | 68.681 kHz | 91.146 kHz | 93.750 kHz |
| | µsec | µsec | µsec | µsec | µsec | µsec | µsec | µsec | µsec | µsec |
| H. TOTAL | 31.778 | 31.777 | 23.111 | 20.110 | 18.631 | 16.600 | 14.561 | 14.560 | 10.971 | 10.667 |
| H. BLK | 6.356 | 6.355 | 5.333 | 5.586 | 4.409 | 3.800 | 3.725 | 3.040 | 2.844 | 2.765 |
| H. FP | 0.636 | 0.636 | 0.889 | 0.559 | 0.569 | 0.550 | 0.508 | 0.320 | 0.305 | 0.316 |
| H. SYNC | 3.813 | 3.813 | 1.333 | 1.117 | 1.138 | 1.200 | 1.016 | 1.280 | 1.016 | 0.948 |
| H. BP | 1.907 | 1.907 | 3.111 | 3.910 | 2.702 | 2.050 | 2.201 | 1.440 | 1.524 | 1.501 |
| H. ACTIV | 25.422 | 25.422 | 17.778 | 14.524 | 14.222 | 12.800 | 10.836 | 11.520 | 8.127 | 7.901 |
| — VERTICAL — | | | | | | | | | | |
| V. FREQ(HZ) | 59.940 Hz | 70.087 Hz | 85.008 Hz | 74.553 Hz | 85.061 Hz | 74.927 Hz | 84.997 Hz | 75.062 Hz | 85.024 Hz | 75.000 Hz |
| | lines | lines | lines | lines | lines | lines | lines | lines | lines | lines |
| V. TOTAL | 525 | 449 | 509 | 667 | 631 | 804 | 808 | 915 | 1072 | 1250 |
| V. BLK | 45 | 49 | 29 | 43 | 31 | 36 | 40 | 45 | 48 | 50 |
| V. FP | 10 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 1 |
| V. SYNC | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| V. BP | 33 | 43 | 25 | 37 | 27 | 30 | 36 | 39 | 44 | 46 |
| V. ACTIV | 480 | 400 | 480 | 624 | 600 | 768 | 768 | 870 | 1024 | 1200 |
| — SYNC — | | | | | | | | | | |
| INT(G) | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| EXT(H/V)/POLARITY | YES N / N | YES N / P | YES N / N | YES N / N | YES P / P | YES N / N | YES P / P | YES N / N | YES P / P | YES P / P |
| EXT(CS)/POLARITY | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| INT/NON INT | NON INT | NON INT | NON INT | NON INT | NON INT | NON INT | NON INT | NON INT | NON INT | NON INT |

96.1.22 VER.

**WARNING!!**
**NEVER TURN ON THE POWER IN A CONDITION IN WHICH THE DEGAUSS COIL HAS BEEN REMOVED.**

**SAFETY-RELATED COMPONENT WARNING!!**
**COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL FOR SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.**

## TABLE OF CONTENTS


| *Section* | *Title* | *Page* |
|---|---|---|
| **1.** | **GENERAL** | 4 |
| **2.** | **DISASSEMBLY** | |
| 2-1. | Cabinet Removal | 10 |
| 2-2. | D and M Boards Removal | 10 |
| 2-3. | G Board Removal | 11 |
| 2-4. | A Board Removal | 11 |
| 2-5. | I/O Terminal Board Assy Removal | 11 |
| 2-6. | Service Position | 12 |
| 2-7. | H, J Boards Removal | 12 |
| 2-8. | Picture Tube Removal | 13 |
| **3.** | **SAFETY RELATED ADJUSTMENT** | 14 |
| **4.** | **ADJUSTMENTS** | 15 |
| **5.** | **DIAGRAMS** | |
| 5-1. | Block Diagram | 17 |
| 5-2. | Frame Schematic Diagram | 20 |
| 5-3. | Circuit Boards Location | 22 |
| 5-4. | Schematic Diagrams and Printed Wiring Boards | 22 |
| (1) | Schematic Diagram of D Board | 23 |
| (2) | Schematic Diagram of A Board | 28 |
| (3) | Schematic Diagram of G Board | 33 |
| (4) | Schematic Diagrams of DA, H, J and M Boards | 37 |
| 5-5. | Semiconductors | 41 |
| **6.** | **EXPLODED VIEWS** | |
| 6-1. | Chassis | 43 |
| 6-2. | Picture Tube | 44 |
| 6-3. | Packing Materials | 45 |
| **7.** | **ELECTRICAL PARTS LIST** | 46 |

**The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual.**

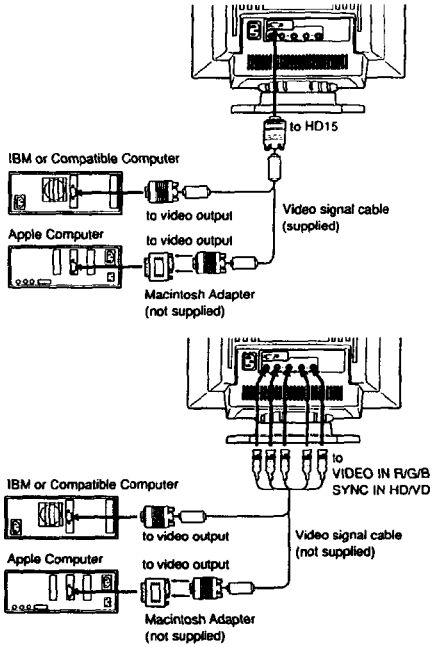
SECTION 1

GENERAL

# Getting Started

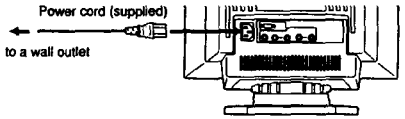
This monitor will sync with any IBM or compatible system equipped with VGA or greater graphics capability. Although this monitor will sync to other platforms, including Macintosh and Power Macintosh system, a cable adapter is required. Please consult your dealer for advice on which adapter is suitable for your needs.

**Step 1:** With the computer switched off, attach the video signal cable to the monitor (HD15/5 BNC's) and attach the other end to the video card.




**Note :** Use HD15 (Female)-HD15(Male without No.9 pin) adapter (supplied) for current DOS computer which has no compliance of DDC 2AB and its No.9 pin is disconnected.

**Step 2:** With the monitor switched off, attach the power cord to the monitor and the other end to the power outlet.




**Step 3:** Turn on the monitor and computer.

**Step 4:** Switch the input connector according to the adjustment procedure on page 10.

**Step 5:** If necessary, adjust the user controls according to your personal preference.

The installation of your monitor is complete. Enjoy your monitor.

**Notice**
To comply with the limits of FCC Class B and IC Class B for digital device, please attach the supplied video signal cable for HD15 input or SMF-400 (sold separately) for BNC input. Furthermore, each cable has ferrite cores on it.



# Using your Monitor

## Preset and User Modes

The Multiscan 20seII has factory preset modes for the 10 most popular industry standards for true "plug and play" capability.

When using a video mode that is not one of the 10 factory preset modes, some fine tuning may be required to optimize the display to your preferences. Simply adjust the monitor according to the preceding adjustment instructions. The adjustments will be stored automatically and recalled whenever that mode is used.
A total of 15 user-defined modes can be stored in memory. If the 16th mode is entered, it will replace the first.

For less common modes, and modes that evolve in the future, the Digital Multiscan Technology of the Multiscan 20seII will perform all of the complex adjustments necessary to ensure a high quality picture for any timing in its frequency range. However, due to the wide variety of video boards on the market, it may be necessary for the user to fine tune the vertical/horizontal size and centering.

**Recommended horizontal timing conditions**
Horizontal sync width duty should be: >4.8% of total horizontal time.
Horizontal blanking width should be: >3.0 µsec.

**Note:** For Windows®[4] users, check your video board manual or the utility program which comes with your graphic board and select the highest available refresh rate to maximize monitor performance.

| No. | Resolution (dots × lines) | Horizontal Frequency | Vertical Frequency | Graphics Mode |
|---|---|---|---|---|
| 1 | 640 × 480 | 31.5 kHz | 60 Hz | VGA Graphic[1] |
| 2 | 720 × 400 | 31.5 kHz | 70 Hz | VGA Text[1] |
| 3 | 640 × 480 | 43.3 kHz | 85 Hz | VESA[2] |
| 4 | 832 × 624 | 49.7 kHz | 75 Hz | Macintosh 16" Color[3] |
| 5 | 800 × 600 | 53.7 kHz | 85 Hz | VESA[2] |
| 6 | 1024 × 768 | 60.2 kHz | 75 Hz | Macintosh 19" Color[3] |
| 7 | 1024 × 768 | 68.7 kHz | 85 Hz | VESA[2] |
| 8 | 1152 × 870 | 68.7 kHz | 75 Hz | Macintosh 21" Color[3] |
| 9 | 1280 × 1024 | 91.1 kHz | 85 Hz | VESA[2] |
| 10 | 1600 × 1200 | 93.8 kHz | 75 Hz | VESA[2] |

1) VGA is a trademark of IBM Corporation.
2) VESA is a trademark of Video Electronics Standard Association.
3) Macintosh is a trademark of Apple Computer Inc.
4) Windows® is a registered trademark of Microsoft Corporation in the United States and other countries.

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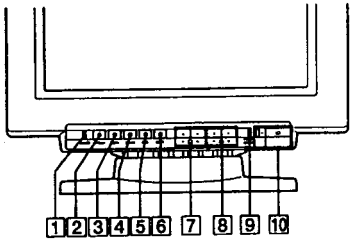
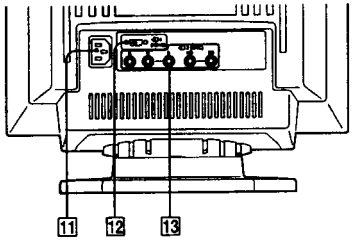
# Functions of Controls

See the given pages for further description.

**Front**




**Rear**




**1 RESET button (page 11)**
Press to reset the adjustment data to the factory-preset levels.

**2 OPTION button (page 9-11)**
Press to set the option items, such as control lock and color temperature.

**3 CONV (convergence) button (page 9)**
Press to adjust the vertical and horizontal convergence.

**4 GEOM (geometry) button (page 8)**
Press to adjust the rotation and pincushion.

**5 SIZE (picture size) button (page 8)**
Press to adjust the vertical and horizontal picture size.

**6 CENT (center) button (page 7)**
Press to adjust the vertical and horizontal picture position.

**7 ☼ (brightness) –/+ (↓/↑) buttons (page 7-11)**
Press to adjust the brightness.

–/+(↓/↑) buttons also adjust the each item.

**8 ◑ (contrast) –/+ (←/→) buttons (page 7-11)**
Press to adjust the contrast.

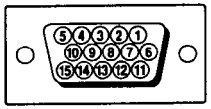
–/+ (←/→) buttons also adjust the each item.

**9 POWER SAVING indicator (page 12)**
Lights up when the monitor is in the Power Saving Modes.

**10 ⏻ power switch and indicator (page 12)**
Press to turn the monitor on or off. The indicator lights up when the monitor is turned on.

**11 AC IN connector**
Plug in an AC power cord.

**12 Video input 1 connector (HD15)**
The cable accepts RGB video signals (0.714 Vp-p, positive) and SYNC signals.




| Pin No. | Signal | Pin No. | Signal |
|---|---|---|---|
| 1 | Red | 8 | Blue Ground |
| 2 | Green (Composite Sync on Green) | 9 | DDC + 5V* |
| | | 10 | Ground |
| | | 11 | — |
| 3 | Blue | 12 | Bi-Directional Data (SDA)* |
| 4 | — | | |
| 5 | DDC Ground* | 13 | H. Sync |
| 6 | Red Ground | 14 | V. Sync |
| 7 | Green Ground | 15 | Data Clock(SCL)* |

* Display Data Channel (DDC) Standard by VESA

**13 Video input 2 connectors (5 BNC)**
The cable accepts RGB video signals (0.714 Vp-p, positive) and SYNC signals.



# Adjustments

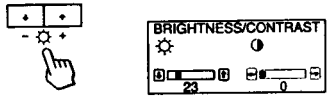
You can adjust the picture to your preference by following the procedure described below.
You can adjust all items on the OSD (On Screen Display).
The item being adjusted is indicated in white on the OSD.

Before adjusting the items, turn on the unit and connect a video cable to the computer/work station.

## Adjusting the Picture Brightness

The adjustment data becomes the common setting for all input signals received.

**1** Press the ☼ ↓/↑ button.
The "BRIGHTNESS/CONTRAST" OSD (On Screen Display) appears.




**2** Press the ☼ ↓/↑ buttons to adjust picture brightness.
↓ . . . for less brightness
↑ . . . for more brightness

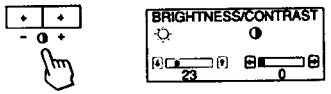
The "BRIGHTNESS/CONTRAST" OSD disappears 3 seconds after you release the buttons.

To reset, press the RESET button while the OSD is on.

## Adjusting the Picture Contrast

The adjustment data becomes the common setting for all input signals received.

**1** Press the ◑ ←/→ button.
The "BRIGHTNESS/CONTRAST" OSD (On Screen Display) appears.




**2** Press the ◑ ←/→ button to adjust picture contrast.
← . . . for less contrast
→ . . . for more contrast

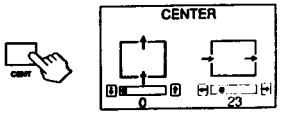
The "BRIGHTNESS/CONTRAST" OSD disappears 3 seconds after you release the buttons.

To reset, press the RESET button while the OSD is on.

## Adjusting the Picture Centering

The adjustment data becomes the unique setting for the input signals received.

**1** Press the CENT button.
The "CENTER" OSD (On Screen Display) appears.




**2** **For vertical adjustment**
Press the ☼ ↓/↑ buttons.

↓ . . . to move down
↑ . . . to move up

**For horizontal adjustment**
Press the ◑ ←/→ buttons.

← . . . to move left
→ . . . to move right

To erase the "CENTER" OSD, press the CENT button again.
The "CENTER" OSD automatically disappears 10 seconds after you release the buttons.

To reset, press the RESET button while the OSD is on.

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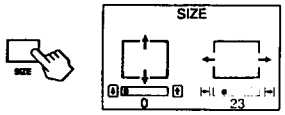
## Adjusting the Picture Size

The adjustment data becomes the unique setting for the input signals received.

**1** Press the SIZE button.
The "SIZE" OSD (On Screen Display) appears.




**2** **For vertical adjustment**
Press the ☼ ↓/↑ buttons.

↓ . . . to diminish
↑ . . . to enlarge

**For horizontal adjustment**
Press the ◑ ←/→ buttons.

← . . . to diminish
→ . . . to enlarge

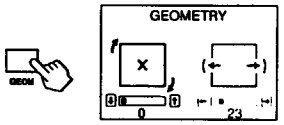
To erase the "SIZE" OSD, press the SIZE button again.
The "SIZE" OSD automatically disappears 10 seconds after you release the buttons.

To reset, press the RESET button while the OSD is on.

## Adjusting the Picture Rotation

The adjustment data becomes the common setting for all input signals received.

**1** Press the GEOM button.
The "GEOMETRY" OSD (On Screen Display) appears.




**2** Press the ☼ ↓/↑ buttons.

↓ . . . to rotate counterclockwise
↑ . . . to rotate clockwise

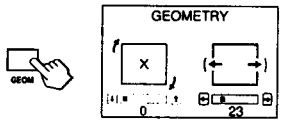
To erase the "GEOMETRY" OSD, press the GEOM button again.
The "GEOMETRY" OSD automatically disappears 10 seconds after you release the buttons.

To reset, press the RESET button while the OSD is on.

## Adjusting the Pincushion

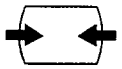
The adjustment data becomes the unique setting for the input signals received.

**1** Press the GEOM button.
The "GEOMETRY" OSD (On Screen Display) appears.

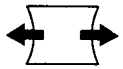



**2** Press the ◑ ←/→ buttons.

← . . . to diminish the picture sides



→ . . . to expand the picture sides



To erase the "GEOMETRY" OSD, press the GEOM button again.
The "GEOMETRY" OSD automatically disappears 10 seconds after you release the buttons.

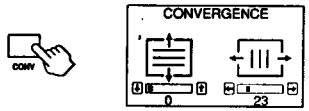
To reset, press the RESET button while the OSD is on.



## Adjusting the Convergence

The adjustment data becomes the common setting for all input signals received.

**1** Press the CONV button.
The "CONVERGENCE" OSD (On Screen Display) appears.




**2** **For vertical adjustment**
Press the ☼ ↓/ ↑ buttons.

↓ . . . to move Red down and Blue up
↑ . . . to move Red up and Blue down

**For horizontal adjustment**
Press the ◑ ←/→ buttons.

← . . . to move Red to the left and Blue to the right
→ . . . to move Red to the right and Blue to the left

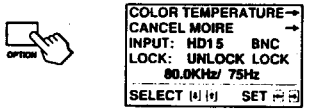
To erase the "CONVERGENCE" OSD, press the CONV button again.
The "CONVERGENCE" OSD automatically disappears 10 seconds after you release the buttons.

To reset, press the RESET button while the OSD is on.

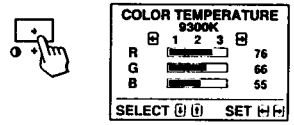
## Setting the Color Temperature

The selected color temperature becomes the common setting for all input signals.

**1** Press the OPTION button.
The OPTION OSD (On Screen Display) appears.




**2** Press the ◑ → button.
The "COLOR TEMPERATURE" OSD appears.

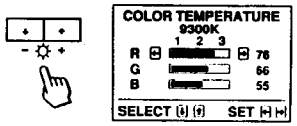



**3** Adjust with the ◑ ←/→ and ☼ ↓/↑ buttons.
There are three color temperature modes on the OSD.
The factory settings are 1 : 5000K, 2 : 6500K, and 3 : 9300K.

**To select 5000K, 6500K or 9300K**
Press the ◑ ←/→ buttons.

**To obtain the desired color temperature**
**1** Press the ◑ ←/→ buttons to select the 1, 2 or 3 mode.

**2** Press the ☼ ↓/↑ buttons to select R, G or B.




**3** Press the ◑ ←/→ buttons to adjust the color temperature.

The "5000K," "6500K" or "9300K" disappears.
The color temperatures are memorized in the each mode-1, 2 and 3 until you reset each.

To erase the "COLOR TEMPERATURE" OSD, press the OPTION button again.
The OSD automatically disappears 30 seconds after you release the buttons.

To reset, press the RESET button while the OSD is on.

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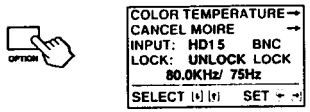
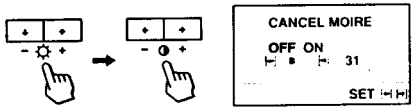
## Canceling the Moire

The adjustment data becomes the unique setting for the input signals received.

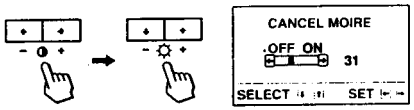
**1** Press the OPTION button.
The OPTION OSD (On Screen Display) appears.




**2** Press the ☼ ↓/↑ buttons to select "CANCEL MOIRE" and then press the ◑ ➡ button.




**3** Press the ◑ ⬅/➡ buttons to select "ON" and then press the ☼ ↓ button.




**4** Press the ◑ ⬅/➡ buttons to adjust for minimum moire.

To erase the "CANCEL MOIRE" OSD, press the OPTION button again.
The OSD automatically disappears 30 seconds after you release the buttons.

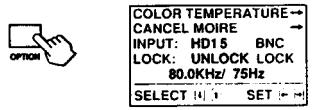
To reset, press the RESET button while the OSD is on.

**Note**
When the moire is cancelled, the picture may be fuzzy. Adjust the moire gradually from 0, and stop the adjustment as near to 0 as possible.

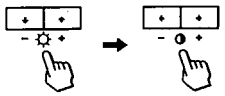
## Switching the Input Connector

As the monitor has two sets of input connectors, you can switch between two input video signals. It is necessary to select the connector type (HD15/5 BNC's) correctly according to the connection.

**1** Press the OPTION button.
The OPTION OSD (On Screen Display) appears.




**2** Press the ☼ ↓/↑ buttons to select "INPUT" and then press the ◑ ⬅/➡ button to select "HD15" or "BNC."



When you switch between input sources, the monitor screen is muted for a moment (Mute) then the signal through the selected input is displayed. If the selected input do not receive any video signals, the monitor automatically returns to the other input after Mute and the OPTION OSD appears.

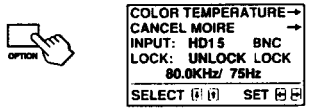
To erase the OPTION OSD, press the OPTION button again. The OSD automatically disappears 30 seconds after you release the buttons.

If two computers are connected to the monitor (one to each input), when one of the computers is turned on or restarted, or the monitor goes into power saving mode, the monitor may switch to the other input because the signal is temporarily interrupted. Select the input which you use, following the above steps.

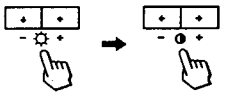
## Locking the Controls

This feature allows you to lock the monitor so that all the buttons, except the ⏻ power switch and OPTION button, on the front panel cannot be operated (Lock mode). Hence, your settings cannot be modified. With this function, you can ensure that your settings will remain the same even when the control buttons are exposed to others.
To release the Lock mode, set it to off (UNLOCK) position. Normally keep this function set to off (UNLOCK) position.

**1** Press the OPTION button.
The OPTION OSD (On Screen Display) appears.




**2** Press the ☼ ↓/↑ buttons to select "LOCK" and then press the ◑ ⬅/➡ buttons to select "LOCK."



The ☼ ↓/↑ buttons do not work on the OPTION OSD. The control buttons on the front panel except the OPTION button do not work. If you press any button except the ⏻ power switch and OPTION button, the O-n mark appears on the screen.

### To Cancel the Control Lock

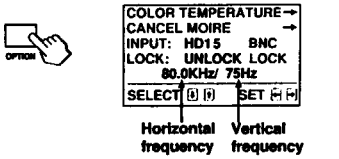
Press the OPTION button again.
Press the ◑ ⬅/➡ buttons to select "UNLOCK."

To erase the OPTION OSD, press the OPTION button again. The OSD automatically disappears 30 seconds after you release the buttons.

## Checking the Signal Frequency

It is possible to check the current vertical and horizontal frequencies of the input signal received.

Press the OPTION button.
The OPTION OSD (On Screen Display) appears.




## Resetting the Adjustment Data to Factory-preset Levels

### To reset an adjustment item

**If you want to reset the color temperature**
Select one of the three color temperature modes, (See "Setting the Color Temperature" on page 9), and then press the RESET button before the OSD (On Screen Display) disappears.

**If you want to reset the other adjustment items**
Press the button of the adjustment item you want to reset, and then press the RESET button before the OSD (On Screen Display) disappears.

### To reset the brightness, contrast, size, center and pincushion adjustment data at once (for the received signal)

Press the RESET button with something like a coin for one second when no OSD is shown.

### To reset all adjustment data to factory-preset levels

Press and hold the RESET button for more than 2 seconds. All adjustment data including the brightness and contrast are reset to factory-preset levels.

EN

# Power Saving Function

This monitor is capable of 3 states of reduced power consumption.

By sensing the absence of one or both sync signals coming from the host computer, it will reduce power consumption as follows.

| Mode | State | Power consumption | Required resumption time | POWER SAVING indicator | ⏻ (power) indicator |
|---|---|---|---|---|---|
| 1 | Normal operation | ≤ 140 W | — | off | green on |
| 2 | Standby (1st step of power saving) | ≤ 100 W | approx. 3 sec. | orange on | green on |
| 3 | Suspend (2nd step of power saving) | ≤ 15 W | approx. 3 sec. | orange on | green on |
| 4 | Active-off (3rd step of power saving) | ≤ 5 W | approx. 10 sec. | orange on | off |
| 5 | Power-off | 0 W | — | off | off |

## Power Saving Operation

The H-sync is not present.
↓
The unit goes into standby state.
The V-sync is not present.
↓
The unit goes into suspend state.
Both the H-sync and V-sync are not present.
↓
The unit goes into active-off state.

The monitor requires a videocard or screen saver software which switches off one or both sync signals to activate the power saving function.

**Caution:** The Power Saving function will automatically put the monitor into the Active-off state if the power switch is turned on without any video signal input. Once the horizontal and vertical syncs are sensed, the monitor will automatically return to its Normal operation state.

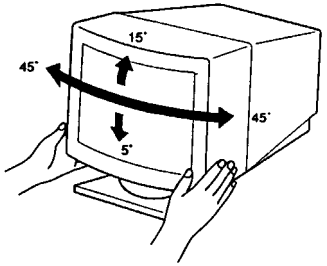
# Plug and Play

This monitor complies with the DDC™1, DDC2B and DDC2AB which are the Display Data Channel (DDC) standards of VESA.
When a DDC1 host system is connected, the monitor synchronizes with the V. CLK in accordance with the VESA standards and outputs the EDID (Extended Display Identification) to the data line.
When a DDC2B or DDC2AB host system is connected, the monitor automatically switches to each communication.

DDC™ is a trademark of Video Electronics Standard Association.

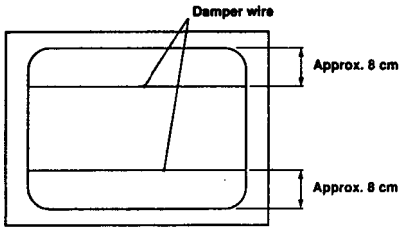
# Use of the Tilt-Swivel

With the tilt-swivel, this unit can be adjusted to be viewed at your desired angle within 90° horizontally and 20° vertically.
To turn the unit vertically and horizontally, hold it at its bottom with both hands as illustrated below.




# Damper Wire

Using a white background, very thin horizontal stripes on the screen are visible as shown below. These stripes are damper wires. These wires are attached to the aperture grille inside the Trinitron tube and are there to damp vibrations of the aperture grille in order to prevent them from influencing to the picture quality.




# Specifications

| | |
|---|---|
| Picture tube | 0.25 mm aperture grille pitch<br>20 inches measured diagonally<br>90-degree deflection |
| Viewable image size | Approx. 387 × 292 mm (w/h)<br>(15 1/4 × 11 1/2 inches)<br>19.0" viewing image |
| Resolution | Horizontal: Max. 1600 dots<br>Vertical: Max. 1200 lines |
| Standard image area | Approx. 373 × 280 mm (w/h)<br>(14 3/4 × 11 1/8 inches)<br>or<br>Aprrox. 350 × 280 mm (w/h)<br>(13 7/8 × 11 1/8 inches) |
| Deflection frequency | Horizontal: 30 to 96 kHz<br>Vertical: 48 to 160 Hz |
| AC input voltage/current | 100 to 120 V, 50/60 Hz, 1.7 A<br>220 to 240 V, 50 – 60 Hz, 1.2 A |
| Power comsumption | Max. 150 W |
| Dimensions | 472 × 493.5 × 501 mm (w/h/d)<br>(18 5/8 × 19 1/2 × 19 3/4 inches) |
| Mass | Approx. 30 kg (66 lb 2 oz) |

Design and specifications are subject to change without notice.

# Troubleshooting

This section may help you isolate a problem and as a result, eliminate the need to contact technical support, allowing continued productivity.

**No picture**

➡ If neither the ⏻ (power) indicator nor the POWER SAVING indicator is not lit.
— Check that the power cord is properly connected.
— Check that the power switch is in the "on" position.

➡ If the POWER SAVING indicator is lit.
— Check that your computer power switch is in the "on" position.
— The monitor will recover when you press any key on the keyboard of the computer.
— Check that the video cable is properly connected and all plugs are firmly seated in their socket.
— Check that the 5 BNC's are connected in the right order (from power cord side: Red-Green-Blue-HD-VD).
— Ensure that no pins are bent or pushed in the HD15 connector of the cable.
— Check that the video card is seated completely in a proper bus slot.
— Check that the video frequency range is within that specified for the monitor.
— If using a Macintosh system, check that the Macintosh adapter and the video signal cable are properly connected.

➡ If the ⏻ (power) and/or the POWER SAVING indicators are both flashing.
— Turn the monitor off and on; If the indicator is off, the monitor is in the normal condition. If the indicator is still flashing, there is a potential monitor failure.

➡ If you do the above procedures and the monitor does not recover.
— Unplug the video cable (HD15/5 BNC's) then press and hold the ◑ + button for 2 seconds to display the color bars. Then, turn the monitor off and on by pressing the ⏻ power switch.
If the monitor does not recover, the monitor is out of order.

**Picture is scrambled**

➡ Check your graphics board manual for the proper monitor setting on your Multiscan 20seII.

➡ Check this manual and confirm that the graphic mode and the frequency at which you are trying to operate is supported. Even within the proper range some video boards may have a sync pulse that is too narrow for the monitor to sync correctly.

EN

## Troubleshooting

**Color is not uniform**

➡ Trip the ⏻ power switch once to activate the Auto-degauss cycle. This function is to demagnetize the metal frame of the CRT to obtain neutral field for uniform color reproduction. If a second degauss cycle is needed, allow a minimum interval of 20 minutes for the best result.

**You cannot adjust the monitor with the buttons on the front panel**

➡ If the control lock is set to on, set it to off using the OPTION OSD. (page 11)
You will be able to adjust the monitor.

**White does not look white**

➡ Adjust color temperature using the OPTION OSD. (page 9)

➡ Check that the 5 BNC's are connected in the right order (from power cord side: Red-Green-Blue-HD-VD).

**Screen image is not centered or sized properly**

➡ Adjust centering, size or geometry using the OSD. (page 7, 8)

➡ Some video modes do not fill the screen to the edge of the monitor. There is no single answer to solve the problem. There is a tendency to have this problem on higher refresh timings.

**Edges of the image are curved**

➡ Adjust pincushion using the OSD. (page 8)

**White lines show red or blue shades at edges**

➡ Adjust the convergence using the OSD. (page 9)

**Picture is fuzzy**

➡ Adjust the contrast and brightness using the OSD (page 7).

➡ Trip the ⏻ power switch once to activate the Auto-degauss cycle. This function demagnetizes the metal frame of the CRT to obtain neutral field for uniform color reproduction. If a second degauss cycle is needed, allow a minimum interval of 20 minutes for the best result.

➡ If red or blue shades are found at the edge of images, adjust convergence using the OSD. (page 9)

➡ If the moire is cancelled on the OPTION OSD, the picture may be fuzzy.
— Select "OFF" on the OPTION OSD. (page 10)

**Picture bounces or has wavy oscillations**

➡ Isolate and eliminate any potential sources of electric or magnetic fields. Common causes for this symptom are electric fans, fluorescent lighting, laser printers, and so on.

➡ If you have another monitor close to this monitor, increase the distance between them to reduce the interference.

➡ Try plugging the monitor into a different AC outlet, preferably on a different circuit.

➡ Try the monitor on a completely different computer in a different room.

**Picture appears to be ghosting**

➡ Eliminate the use of video cable extension cable and/or video switch boxes if this symptom occurs. Excessive cable length or weak connection can produce this symptom.

**Two fine horizontal lines (wires) are visible**

➡ These wires stabilize the vertically striped Aperture Grille. This Aperture Grille allows more light to pass through to the screen giving the Trinitron CRT more color and brightness.

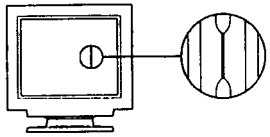
**Wavy or elliptical (moire) pattern is visible**

➡ Due to the relationship between resolution, monitor dot pitch and the pitch of some image patterns, certain screen backgrounds, especially gray, sometimes show moire. This can only be eliminated by changing your desktop pattern.

➡ Cancel the moire using the OPTION OSD. (page 10)
May be modified according to the model.

**Because of vibration and shock during trasportation, the aperture grille may slip out the place and black stripes may appear**

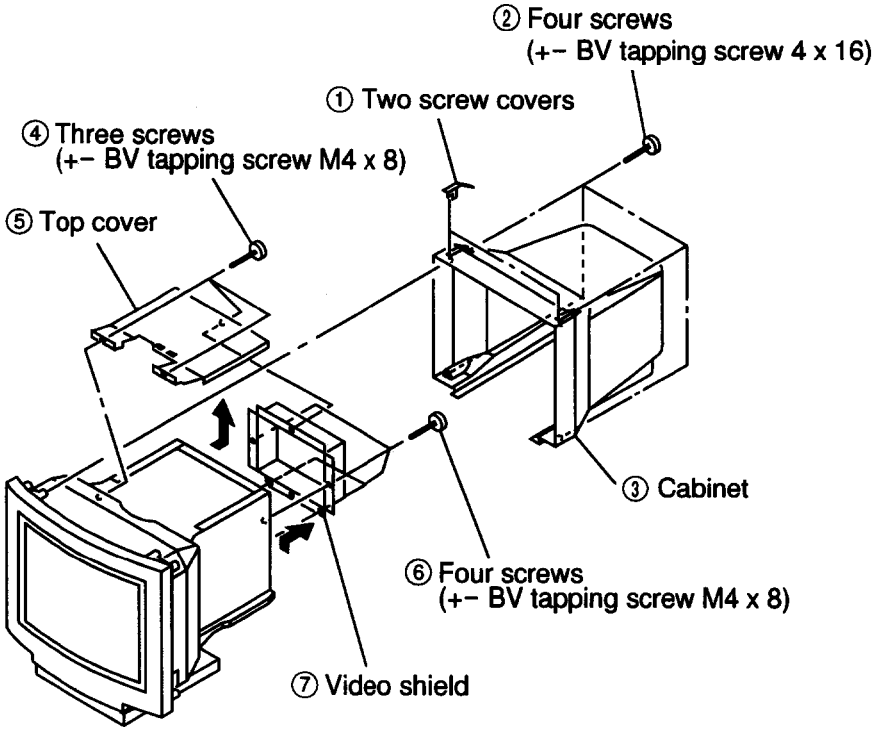
➡ Lightly pat the sides of the monitor.



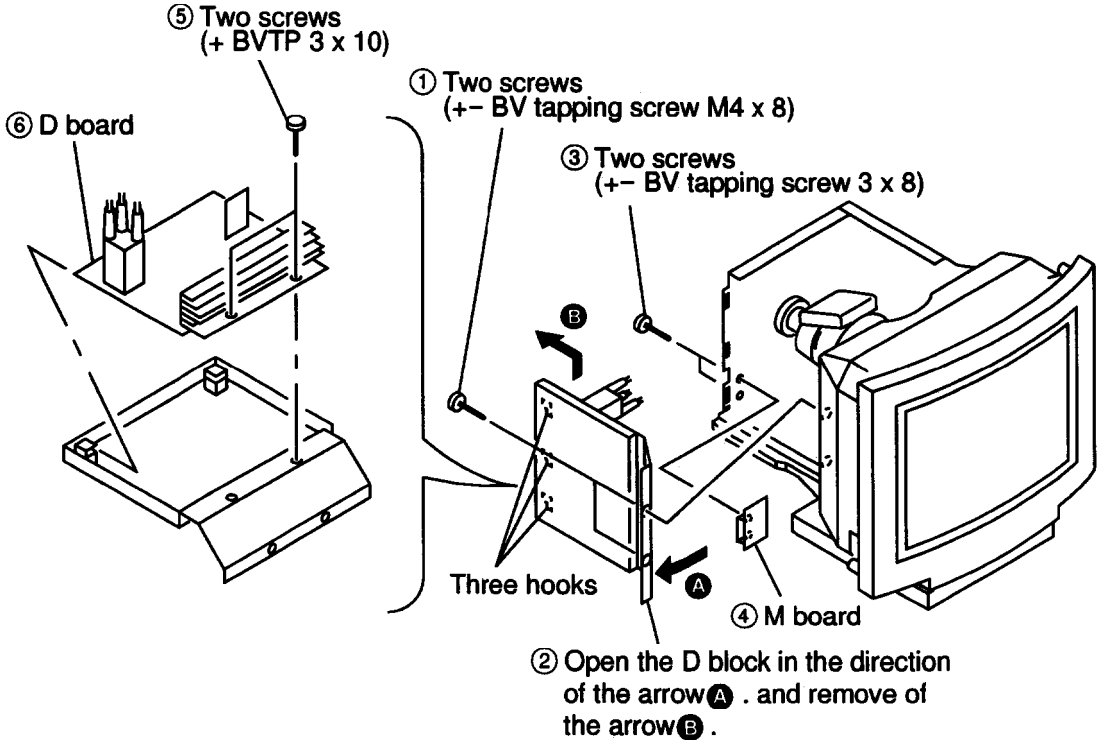
- If the problem persists, call your authorized Sony dealer from a location near your monitor.
- Note the model name and the serial number of your monitor. Also note the make and name of your computer and video board.

# SECTION 2
# DISASSEMBLY

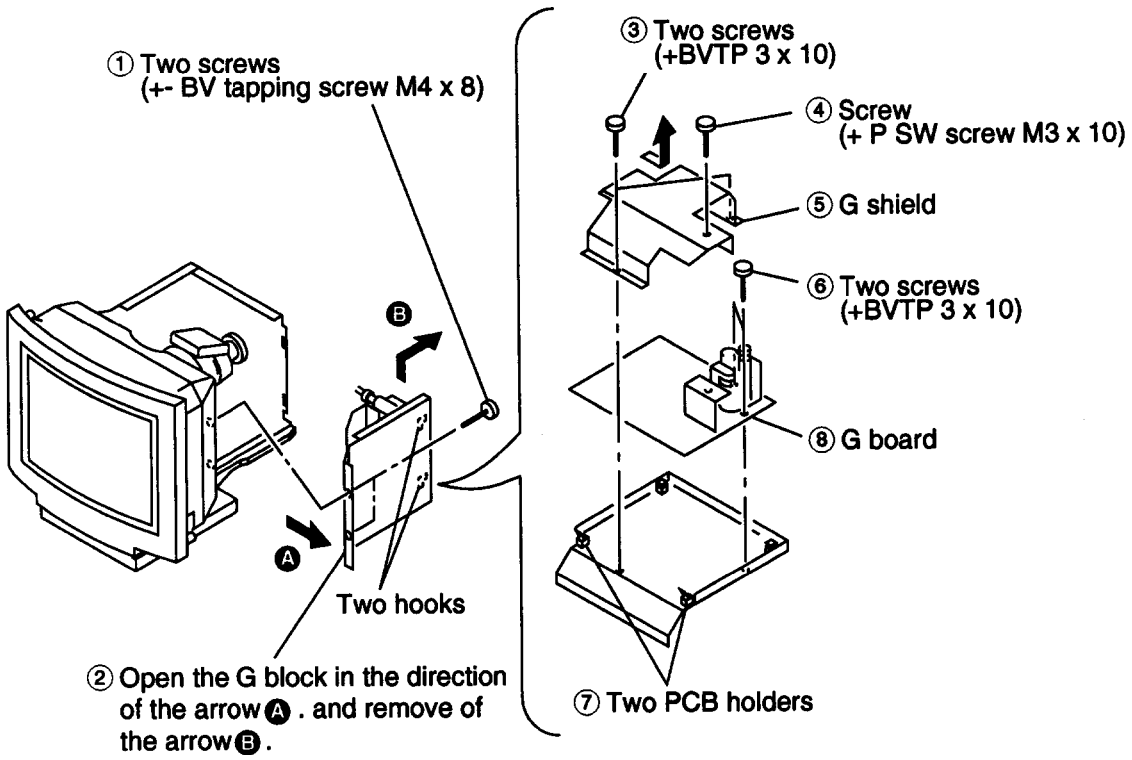
## 2-1. CABINET REMOVAL


② Four screws
(+− BV tapping screw 4 x 16)
① Two screw covers
④ Three screws
(+− BV tapping screw M4 x 8)
⑤ Top cover
③ Cabinet
⑥ Four screws
(+− BV tapping screw M4 x 8)
⑦ Video shield

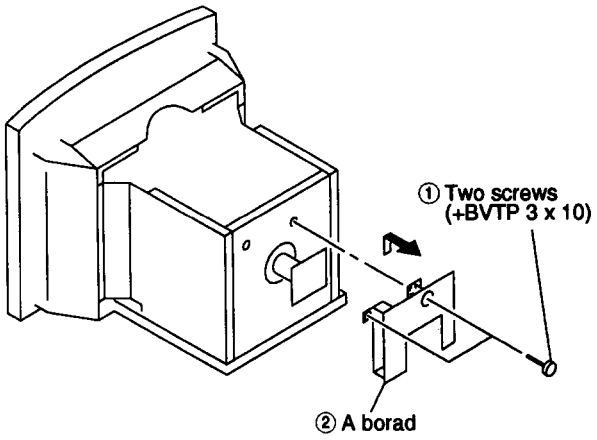
## 2-2. D AND M BOARDS REMOVAL


⑤ Two screws
(+ BVTP 3 x 10)
① Two screws
(+− BV tapping screw M4 x 8)
⑥ D board
③ Two screws
(+− BV tapping screw 3 x 8)
Three hooks
④ M board
② Open the D block in the direction
of the arrow Ⓐ . and remove of
the arrow Ⓑ .

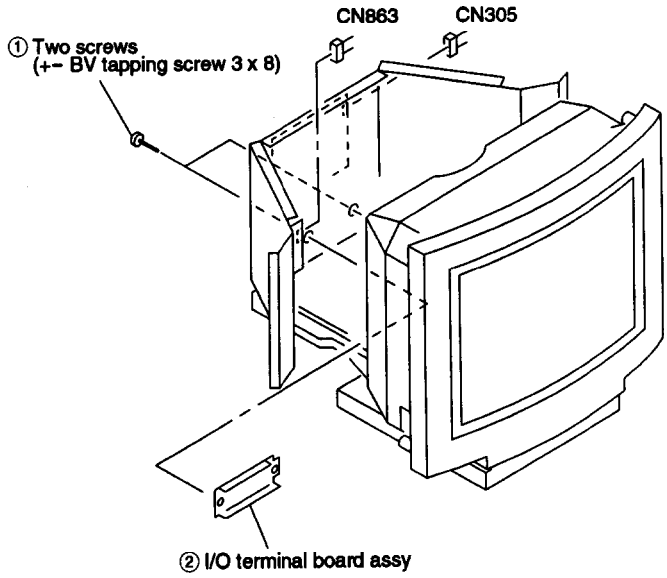
## 2-3. G BOARD REMOVAL


① Two screws
(+- BV tapping screw M4 x 8)
③ Two screws
(+BVTP 3 x 10)
④ Screw
(+ P SW screw M3 x 10)
⑤ G shield
⑥ Two screws
(+BVTP 3 x 10)
⑧ G board
Two hooks
② Open the G block in the direction of the arrow Ⓐ. and remove of the arrow Ⓑ.
⑦ Two PCB holders

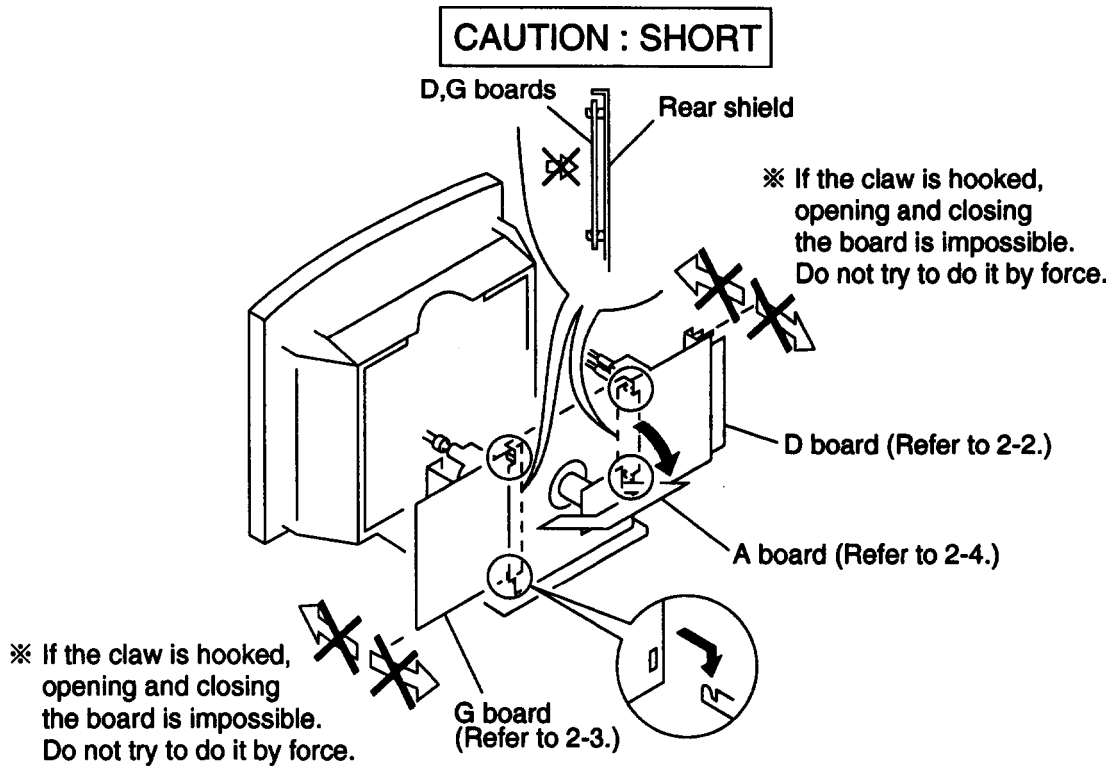
## 2-4. A BOARD REMOVAL



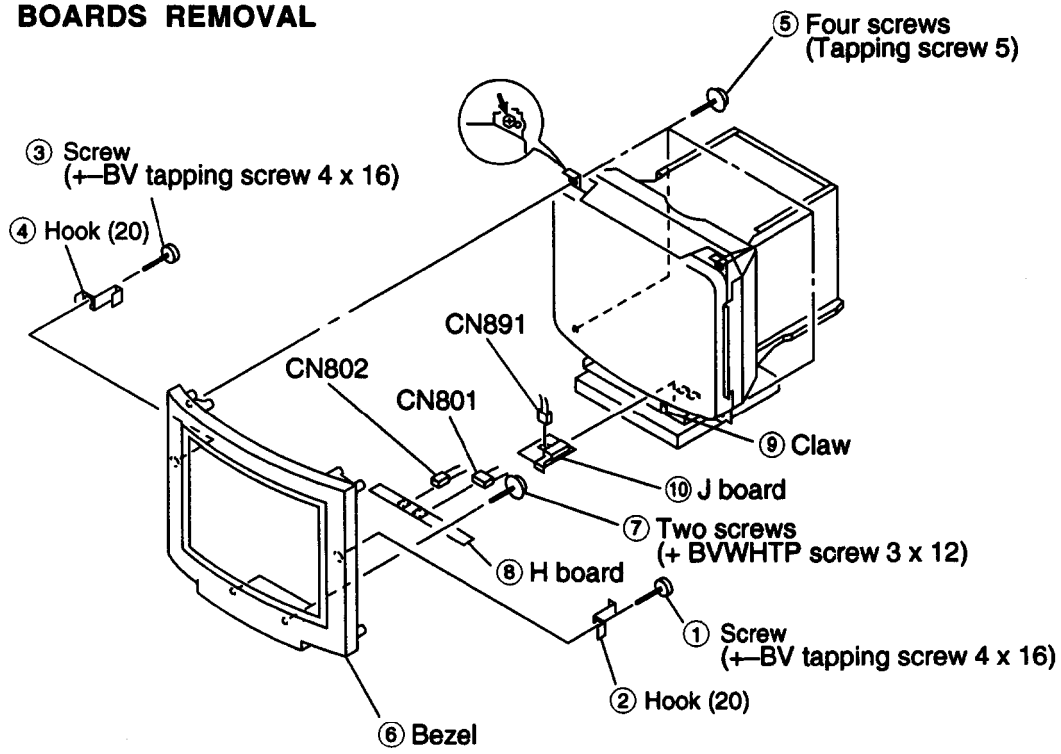

## 2-5. I/O TERMINAL BOARD ASSY REMOVAL



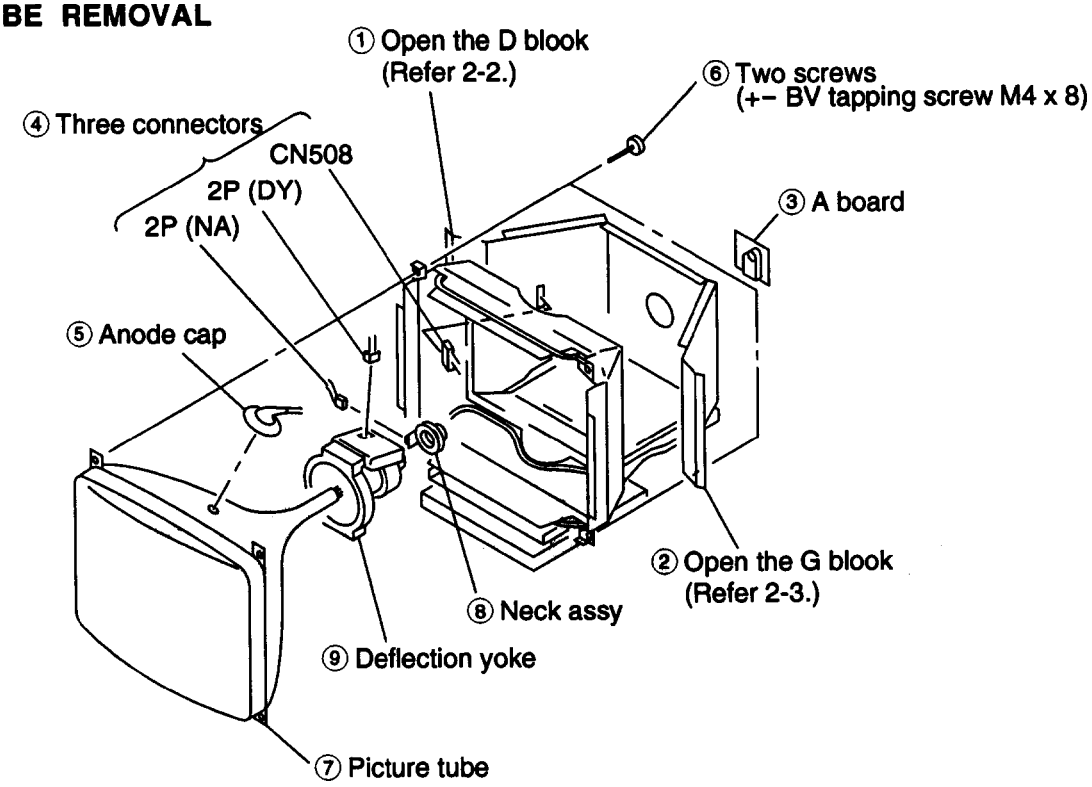
## 2-6. SERVICE POSITION


CAUTION : SHORT
D,G boards
Rear shield
※ If the claw is hooked, opening and closing the board is impossible. Do not try to do it by force.
D board (Refer to 2-2.)
A board (Refer to 2-4.)
※ If the claw is hooked, opening and closing the board is impossible. Do not try to do it by force.
G board (Refer to 2-3.)

## 2-7. H, J BOARDS REMOVAL

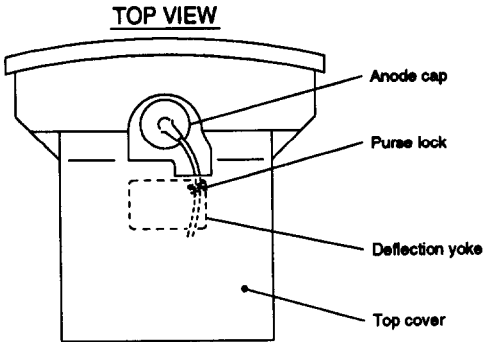


## 2-8. PICTURE TUBE REMOVAL




### • INSTALLED POSITION OF THE ANODE-CAP

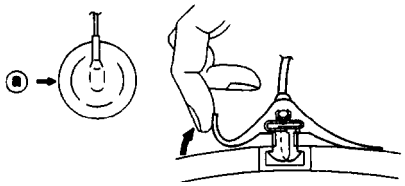
Install the anode cap as shown a figure.



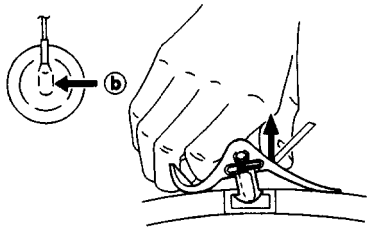

### • REMOVAL OF ANODE-CAP

NOTE: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon painted on the CRT, after removing the anode.

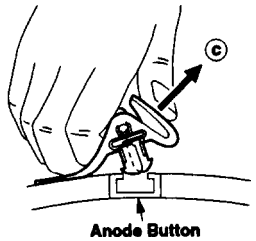
### • REMOVING PROCEDURES




① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.



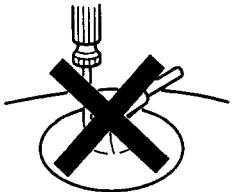

② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.

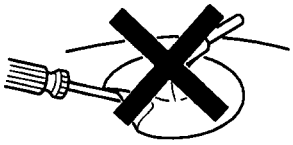



③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling up it in the direction of the arrow ⓒ.

### • HOW TO HANDLE AN ANODE-CAP

① Don't hurt the surface of anode-caps with shartp shaped material!
② Don't press the rubber hardly not to hurt inside of anode-caps!
A material fitting called as shatter-hook terminal is built in the rubber.
③ Don't turn the foot of rubber over hardly!
The shatter-hook terminal will stick out or hurt the rubber.





# SECTION 3
# SAFETY RELATED ADJUSTMENT

When replacing or repairing the shown below table, the following operational checks must be performed as a safety precaution against X-rays emissions from the unit.

| | Part Replaced (◪) | |
|---|---|---|
| HV Regulator Circuit Check | G board | IC901<br>• Mounted G board |
| HV Hold-Down Circuit Check | G board | D935<br>• Mounted G board |
| Beam Current Protector Circuit Check-1 | G board | IC901, D933, D934, R907, R908, R909, R910<br>• Mounted G board |
| Beam Current Protector Circuit Check-2 | G board | R973, R974<br>• Mounted G board |
| Voltage of 3rd winding of FBT | G board | T902 (FBT)<br>• Mounted G board |

### Check Condition

Input voltage : 100~120 VAC
Input signal : White dots or Cross Hatch
Controls : BRT and CONT → Minimum
B+ voltage : 175~185 VDC

### a) HV Regulator Check

1) Confirm that the voltage of the pin ⑯ of IC901 on G board is within the voltage range shown below.
Standard: 9.00±0.10 VDC

### b) HV Hold-Down Circuit Check

1) Using an external DC power supply, apply the voltage shown below between cathode of D916 on G board and ground, and confirm that the HV Hold-Down circuit works. (TV Raster disappears)
Check Condition: Less than 31.30 VDC

### c) Beam Current Protector Circuit Check-1

1) Record the initial regulation value of ABL-SHUTDOWN and using a PC computer, input the "255" for maximum value of resistor.
2) Connect to the Constant Current Jig (A) between pin ⑪ of T902 (FBT) on G board and ground, and confirm that the Beam Current Protector Circuit works. (TV Raster disappears)
Check Condition: Less than 1.34 mA

### d) Beam Current Protector Circuit Check-2

Input the initial regulation value of ABL-SHUTDOWN that was recorded c)-1).

1) Shorted between pin ⑪ of IC901 and ground.
2) Connect to the Constant Current Jig (A) between pin ⑪ of T902 (FBT) on G board and ground, and confirm that the Beam Current Protector Circuit works. (TV Raster disappears)
Check Condition: Less than 1.63 mA

### e) Voltage of 3rd winding of FBT

1) Confirm that the voltage of the cathode of D916 on G board is within the voltage range shown below.
Satndard: Less than 23.30 VDC

# SECTION 4
# ADJUSTMENTS

## ●Landing Rough Adjustment

1. Enter the full white signal. (or the full black dots signal).
2. Adjust the contrast to the maximum.
3. Make the screen monogreen.
4. Adjust the brightness is easy to see with the G2 resistor.
5. Reverse the DY, and adjust coarsely the purity magnet so that a green raster positions in the center of screen.
6. Moving the DY forward, adjust so that an entire screen becomes monogreen.
7. Adjust the tilt of DY, and fix lightly with a clamp.

## ●Landing Fine Adjustment

1. Put the set inside the Helmholtz coil.
2. Input the single green signal and set the CONT control to MAX.

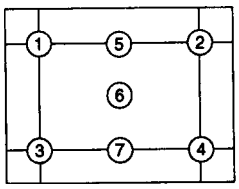
Note: Set to Σ 1k=300 μA with the signal green signal, and after aging for about 30 minutes, adjust so that it is exactly this value.

3. Demagnetize the metal part of the chassis with the hand degausser and coil degausser, and the CRT surface with the hand degausser.
   Input AC 230V to AC IN, turn on and off the power to perform auto degaussing. (Perform auto degaussing by setting "MONCONREG2"=152. Return to the original value after use.)
   Demagnetize the CRT surface with the hand degausser again.

Note:
(1) Adjust in s non-magnetic field. BV=45uT.
(2) If adjusting in a magnetic fields, add the shift from the non-magnetic field in your estimation.

4. Attach the wobbling coil to the designated part of the CRT neck.
5. Attach the sensor of the landing adjustment unit on the CRT surface.
6. Adjust the DY position and purity, and the DY tilt, and landing of the center and 4 corners with the landing checker.

<Specification>




Adjust the green of corners 1 to 4, and center 6 to ±5 μm, and red and blue to within ±7 μm of green, and the difference between red and blue to within ±10 μm.
Adjust the green of 5 and 7 to within ±10 μm, and red and blue to within ±7 μm of green, and the difference between red and blue to within ±10 μm.

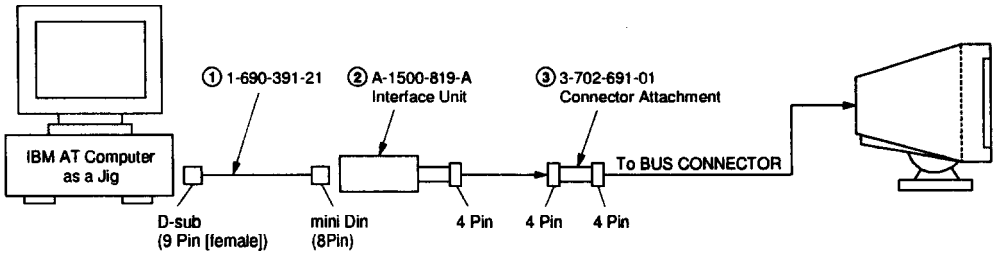
(Set each corner to 1st frame of the crosshatch.)

7. For the up/down and left/right swing, swing the DY and insert a wedge so that the up and down pins are equal at the top and bottom and the horizontal trapezoid is equal at the left and right. Insert the wedge firmly so that the DY does not shake.
8. Check the landing of each corner, and if they do not satisfy the specification, paste a Disk-Mg onto the funnel and adjust.

Note:
(1) Do not paste more than 2 magnets to one corner.
(2) Paste within 80 to 100 mm from the DY on the diagonal line of the magnet.
(3) If using the magnet, be sure to demagnetize with the hand degausser and check.

9. Remove the sensor and wobbling coil.
10. Switch the signal to R.G.B., and check that each color is pure.
11. Check that the DY is not tilting, and fix the purity Mg with a white pen.

Connect the communication cable of the computer to the connector located on the D board on the monitor. Run the service software and then follow the instruction.




*The parts above (①~③) are necessary for DAS adjustment.

## ● Convergence Rough Adjustment

(1) Receive an image of the white crosshatch signals (white lines on black).
(2) Place the protrusions of the 6-fold poles magnet attached to the CRT neck upon each other.
(3) Make rough adjustment of the H direction convergence by using H. STAT VR (left side of the video block).
(4) Make a rough adjustment of the V direction convergence by using "V. STAT".

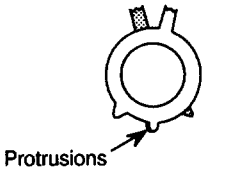



*Fig. 1*

*Fig. 3*

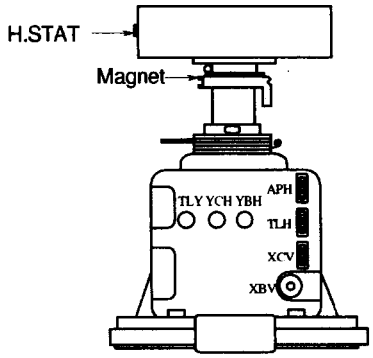
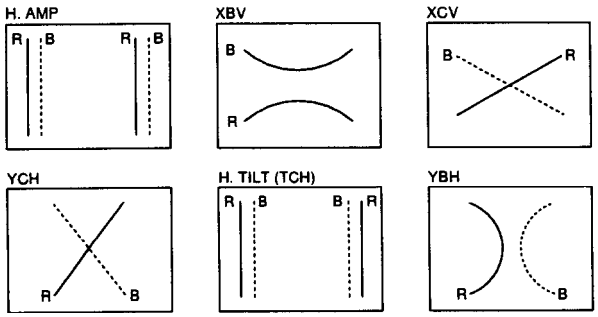
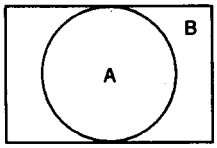



*Fig. 2*

※ Set so that the protruding parts of the 2 magnet rings agree with each other.




## ● Convergence Specification

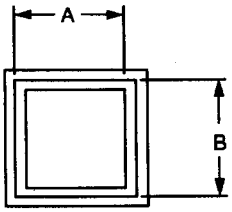



| MODE | 9 | 1-8, 10 |
|---|---|---|
| A | 0.24 mm | 0.28 mm |
| B | 0.28 mm | 0.32 mm |

## ● White Balance Adjustment Specification

(1) 9300K
x = 0.283 ± 0.010
y = 0.298 ± 0.008
(All White)
(2) 6500K
x = 0.313 ± 0.010
y = 0.329 ± 0.008
(All White)
(3) 5000K
x = 0.346 ± 0.008
y = 0.359 ± 0.008
(All White)

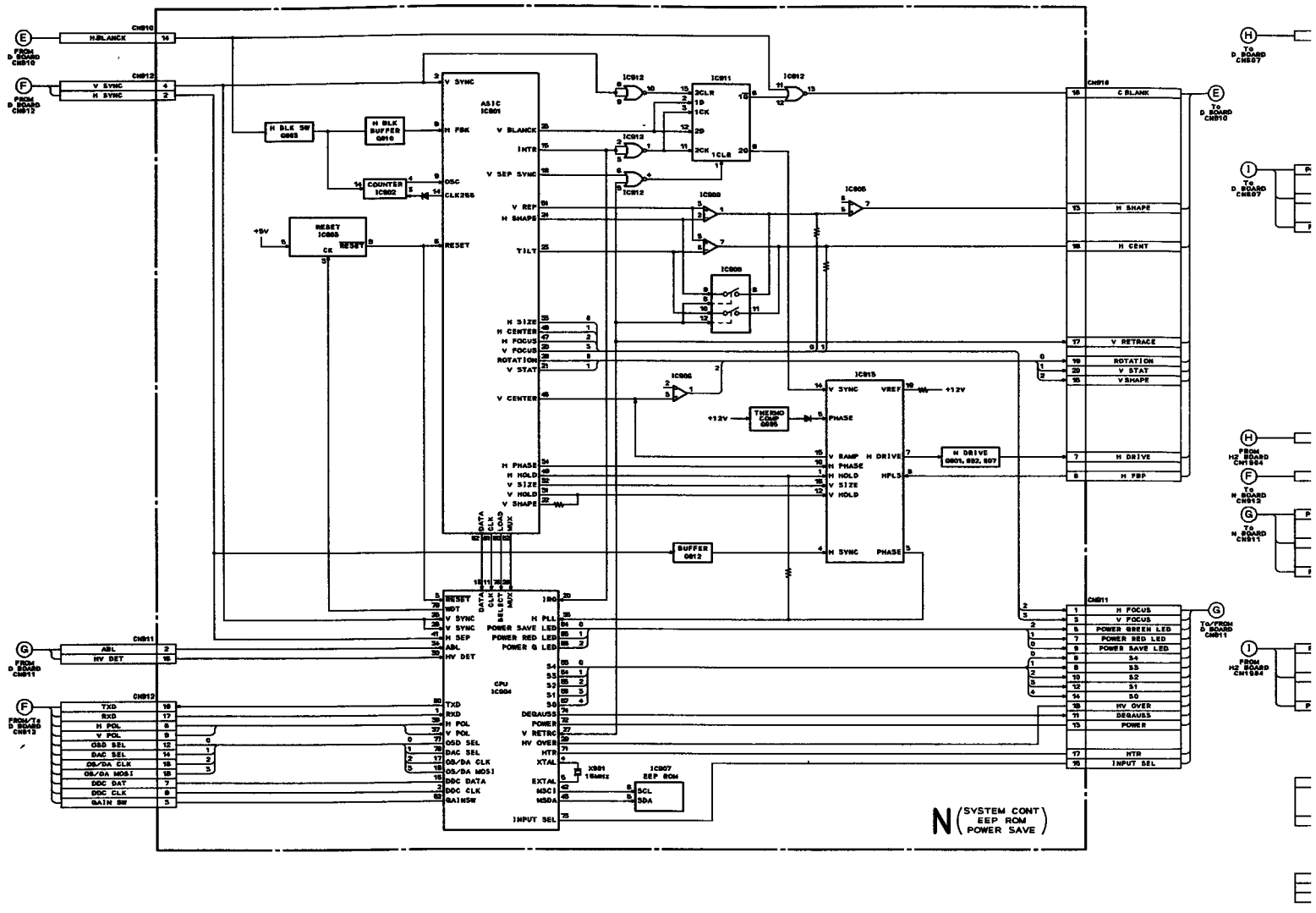
## ● Vertical and Horizontal Position and Size Specification

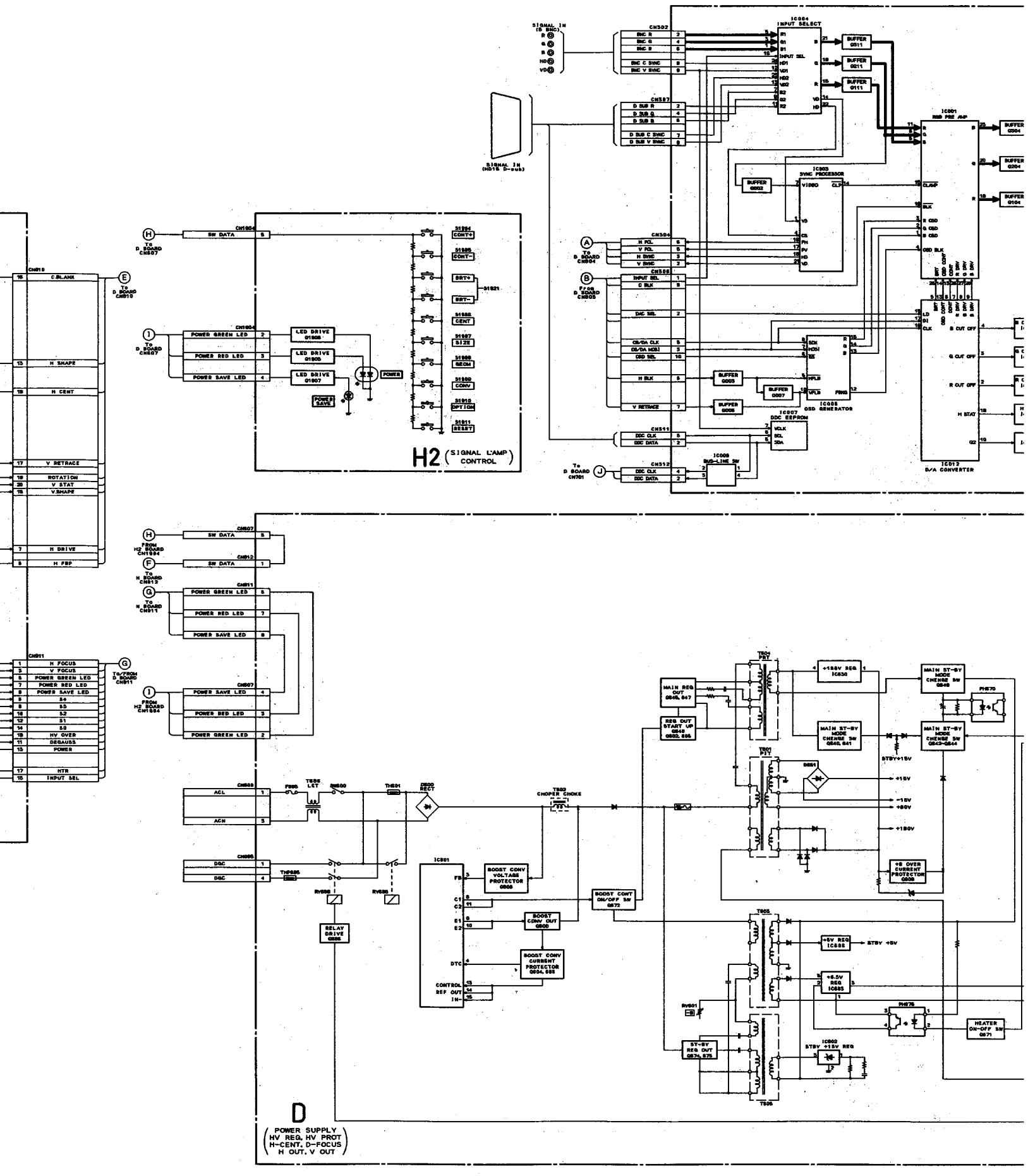


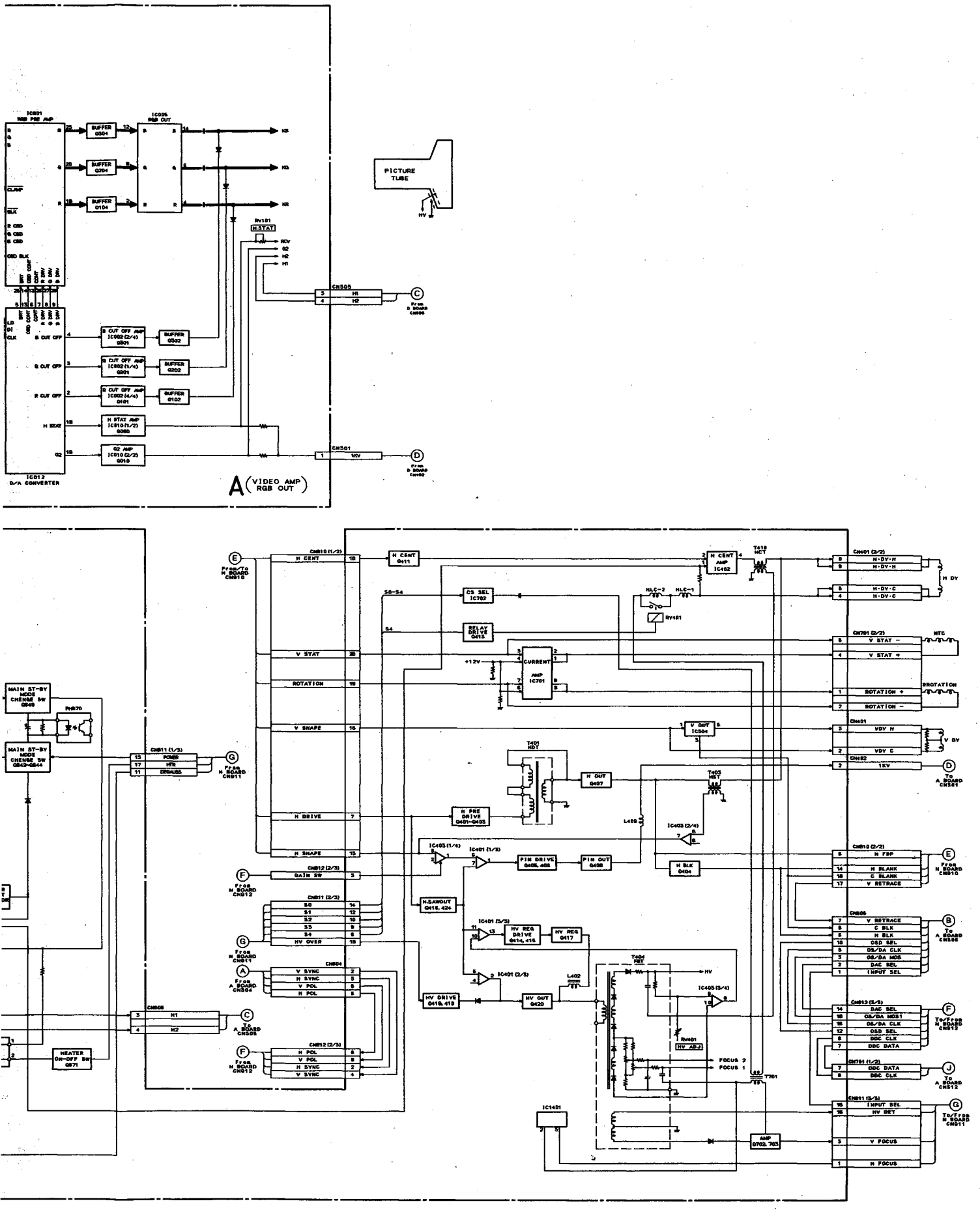

| MODE | 9 | 1-8, 10 |
|---|---|---|
| A | 350 mm | 373 mm |
| B | 280 mm | 280 mm |

# SECTION 5
# DIAGRAMS

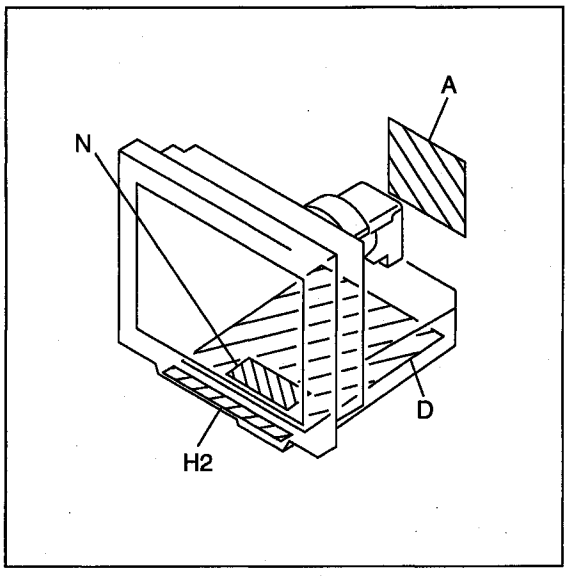
## 5-1. BLOCK DIAGRAM (with FRAME SCHEMATIC DIAGRAM)




H2 (SIGNAL LAMP CONTROL)
D
(POWER SUPPLY
HV REG, HV PROT
H-CENT, D-FOCUS
H OUT, V OUT)


PICTURE TUBE
BUFFER Q304
BUFFER Q204
BUFFER Q104
RV101 H.STAT
CN505
CN501
IC812 D/A CONVERTER
A (VIDEO AMP) RGB OUT
MAIN ST-BY MODE CHENGE SW Q849
MAIN ST-BY MODE CHENGE SW Q849-Q864
CN811 (1/3)
CN810 (1/2)
CN812 (2/3)
CN811 (2/3)
CN804
CN805
CN812 (3/3)
H CENT
V STAT
ROTATION
V SHAPE
H DRIVE
H SHAPE
GAIN SW
S0
S1
S2
S3
S4
HV OVER
V SYNC
H SYNC
V POL
H POL
HEATER ON-OFF SW Q871
H CENT Q411
CS SEL IC702
RELAY DRIVE Q413
CURRENT AMP IC701
H OUT Q407
H PRE DRIVE Q401-Q405
PIN DRIVE Q408, 409
PIN OUT Q409
H.SAWOUT Q418, 424
HV REG DRIVE Q414, 416
HV REG Q417
HV DRIVE Q418, 419
HV OUT Q420
H BLK Q404
V OUT IC704
H CENT AMP IC452
T410 HOT
T401 HOT
T403 HOT
T404 FBT
T701
RV401 HV ADJ
L402
L403
IC1401
AMP Q702, 703
CN401 (2/2)
CN701 (2/2)
CN402
CN810 (2/2)
CN805
CN812 (1/3)
CN811 (3/3)
H DY
V DY
NTC
RROTATION
FOCUS 2
FOCUS 1
H FBP
H BLANK
C BLANK
V RETRACE
V BLK
C BLK
OSD SEL
DB/DA CLK
DB/DA MOSI
DAC SEL
INPUT SEL
DDC DATA
DDC CLK
HV DET
V FOCUS
H FOCUS

## 5-2. CIRCUIT BOARDS LOCATION




## 5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

**Note:**

- All capacitors are in μF unless otherwise noted. pF: μμF 50 V or less are not indicated except for electrolytic.
- Indication of resistance, which does not have one for rating electrical power, is as follows.

  Pitch: 5 mm
  Rating electrical power 1/4 W (CHIP : 1/10 W)

- All resistors are in ohms.
- : nonflammable resistor.
- : fusible resistor.
- △ : internal component.
- □ : panel designation, and adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊥ : earth-ground.
- ⏚ : earth-chassis.
- The components identified by ⊠ in this basic schematic diagram have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation.
  Should replacement be required, replace only with the value originally used.
- When replacing components identified by ◪, make the necessary adjustments indicated. (See page 13)
- When replacing the part in below table, be sure to perform the related adjustment.

| | Part replaced ( ⊠ ) |
|---|---|
| HV ADJ | RV401 |

| | Part replaced ( ◪ ) | |
|---|---|---|
| HV Regulator Circuit | D board | IC401, IC403, RV401, FBT (T404), D425, R423, R460, R461, R462, R493 • Mounted D board |
| HV Hold-Down Circuit | D board | IC401, D439, D442, D443, D444, R422, R435, R448, R490 • Mounted D board |
| Beam Current Protector Circuit | D board | IC401, D429, D445, R435, R470, R472, R487, R497, R501, R503, R508 • Mounted D board |

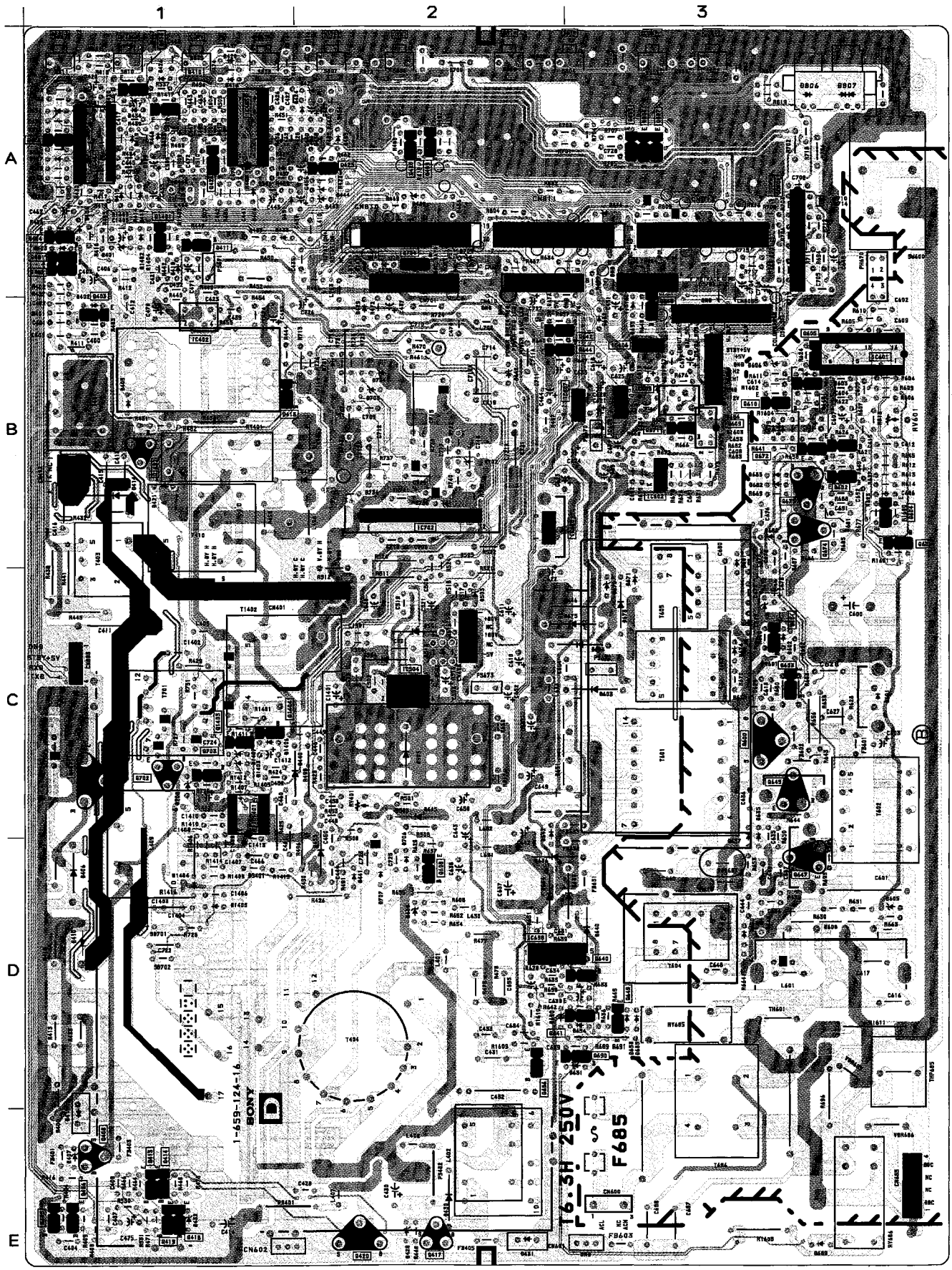
- All voltages are in V.
- Readings are taken with a 10 MΩ digital multimeter.
- Readings are taken with a color-bar signal input.
- Voltage variations may be noted due to normal production tolerances.
- * : Can not be measured.
- Circled numbers are waveform references.
- ——— : B + bus.
- — — — : B – bus.

**Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.**

**Note: Les composants identifiés per un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.**

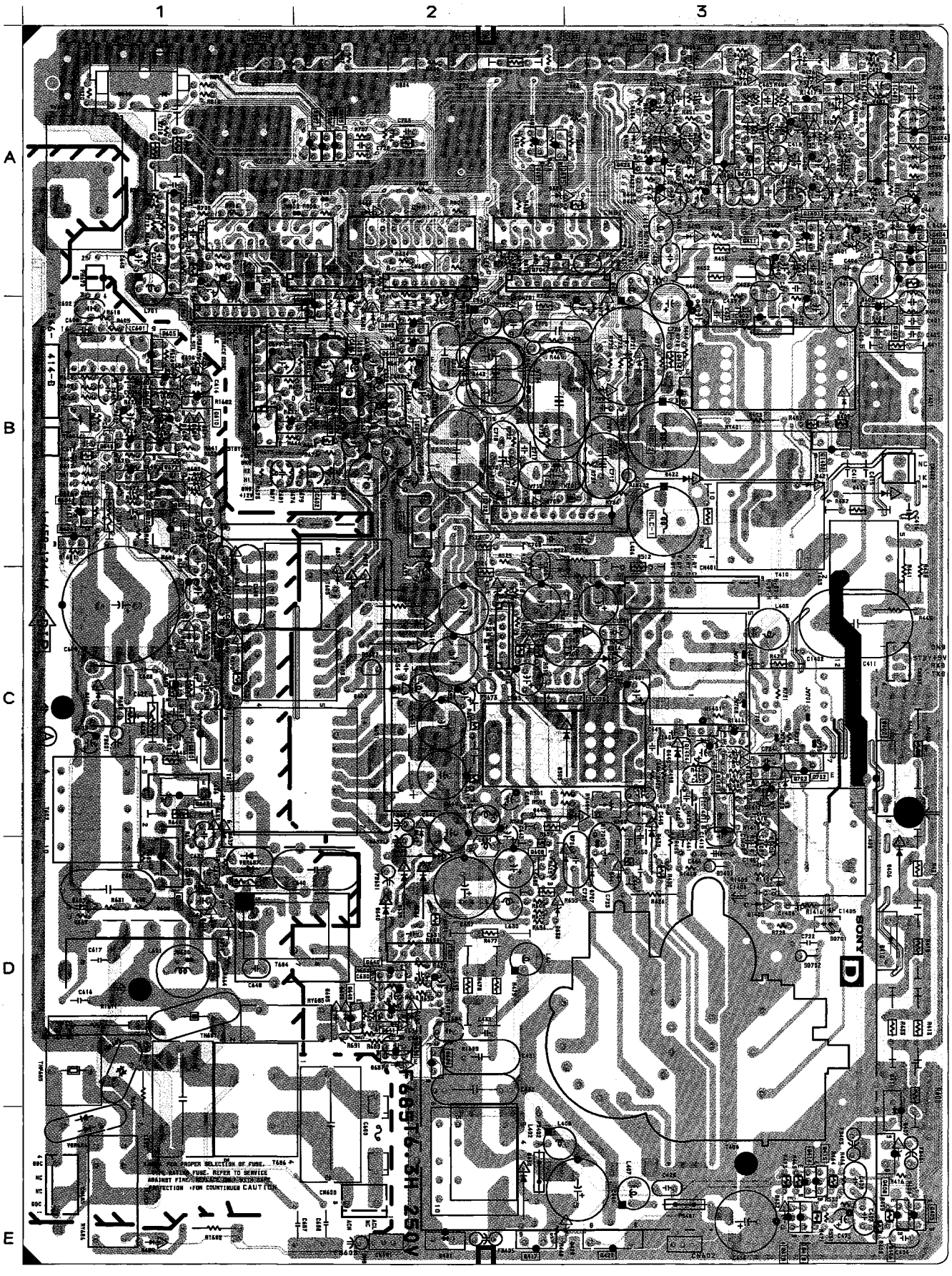
**D** [POWER SUPPLY, HV REG
HV PROT, H-CENTER
D-FOCUS, H-OUT, V-OUT]

## — D BOARD (Conductor side) —




- ▒▒▒ : Pattern from the side which enables seeing.
- ▒▒▒ : Pattern of the rear side.

## — D BOARD (Component side) —




◦ ▒▒▒▒ : Pattern from the side which enables seeing.

• ▒▒▒▒ : Pattern of the rear side.

(1) Schematic Diagram of D Board

## ● D BOARD SEMICONDUCTOR LOCATION

### IC

| | (Conductor) Side | (Component) Side |
|---|---|---|
| IC401 | A–1 | A–3 |
| IC402 | B–1 | B–3 |
| IC403 | A–1 | A–3 |
| IC504 | C–2 | C–3 |
| IC601 | B–3 | B–1 |
| IC602 | B–3 | B–1 |
| IC603 | B–3 | B–2 |
| IC606 | B–3 | B–2 |
| IC607 | B–3 | B–2 |
| IC608 | B–2 | B–2 |
| IC609 | B–3 | B–2 |
| IC630 | D–2 | D–2 |
| IC701 | A–3 | A–1 |
| IC702 | B–2 | B–2 |
| IC1401 | C–1 | C–3 |

### TRANSISTOR

| | (Conductor) Side | (Component) Side |
|---|---|---|
| Q401 | A–1 | A–3 |
| Q402 | A–1 | A–3 |
| Q403 | B–1 | B–3 |
| Q404 | A–1 | A–3 |
| Q405 | E–1 | E–3 |
| Q406 | E–1 | E–3 |
| Q407 | C–1 | C–3 |
| Q408 | E–1 | E–2 |
| Q409 | A–2 | A–2 |
| Q410 | A–1 | A–3 |
| Q411 | A–1 | A–3 |
| Q413 | B–1 | B–3 |
| Q414 | E–1 | E–3 |
| Q415 | E–1 | E–3 |
| Q416 | A–1 | A–3 |
| Q417 | E–2 | E–1 |
| Q418 | E–1 | E–3 |
| Q419 | E–1 | E–3 |
| Q420 | E–2 | E–3 |
| Q423 | A–2 | A–3 |
| Q424 | A–1 | A–3 |
| Q425 | A–2 | A–2 |
| Q426 | A–1 | A–3 |
| Q600 | C–3 | C–1 |
| Q601 | C–3 | C–1 |
| Q602 | B–3 | B–1 |
| Q603 | C–3 | C–1 |
| Q604 | B–3 | B–1 |
| Q605 | B–3 | B–1 |
| Q606 | B–3 | B–1 |
| Q608 | D–2 | D–2 |
| Q609 | B–3 | B–1 |
| Q610 | B–3 | B–1 |
| Q640 | D–3 | D–2 |
| Q641 | D–3 | D–2 |
| Q642 | B–2 | B–2 |
| Q643 | B–3 | B–2 |
| Q644 | B–2 | B–2 |
| Q645 | C–3 | C–1 |
| Q647 | D–3 | D–1 |
| Q648 | B–3 | B–1 |
| Q649 | D–3 | D–2 |
| Q671 | B–3 | B–1 |
| Q672 | B–3 | B–1 |
| Q674 | B–3 | B–1 |
| Q675 | B–3 | B–1 |
| Q686 | D–2 | D–2 |
| Q690 | D–2 | D–2 |
| Q702 | C–1 | C–3 |
| Q703 | C–1 | C–3 |
| Q704 | A–2 | A–2 |
| Q1401 | A–1 | A–3 |
| Q1402 | B–1 | B–3 |
| Q1403 | C–1 | C–3 |
| Q1404 | C–1 | C–3 |

### DIODE

| | (Conductor) Side | (Component) Side |
|---|---|---|
| D401 | A–1 | A–3 |
| D402 | B–1 | B–3 |
| D403 | A–1 | A–3 |
| D404 | A–1 | A–3 |
| D405 | B–1 | B–3 |
| D406 | D–1 | D–3 |
| D407 | E–1 | E–3 |
| D408 | A–2 | A–2 |
| D410 | D–1 | D–3 |
| D411 | E–1 | D–3 |
| D412 | A–1 | A–3 |
| D413 | A–1 | A–3 |
| D414 | B–1 | B–3 |
| D415 | A–1 | A–3 |
| D416 | A–1 | A–3 |
| D417 | A–1 | A–3 |
| D418 | A–1 | A–3 |
| D419 | A–1 | A–3 |
| D420 | A–1 | A–3 |
| D421 | A–1 | B–3 |
| D422 | B–2 | B–3 |
| D423 | A–1 | A–3 |
| D424 | A–2 | A–3 |
| D425 | A–2 | A–3 |
| D426 | A–1 | A–3 |
| D427 | A–1 | A–3 |
| D428 | E–2 | E–3 |
| D429 | B–2 | B–3 |
| D430 | E–2 | E–2 |
| D431 | E–1 | E–2 |
| D432 | E–1 | E–3 |
| D433 | A–1 | A–3 |
| D434 | A–1 | A–3 |
| D438 | A–2 | A–3 |
| D439 | D–2 | C–3 |
| D440 | C–1 | C–3 |
| D441 | D–2 | D–3 |
| D442 | B–2 | B–2 |
| D443 | A–2 | A–3 |
| D444 | A–2 | A–3 |
| D445 | A–2 | A–3 |
| D446 | A–3 | A–2 |
| D448 | A–1 | A–3 |
| D451 | A–1 | A–3 |
| D454 | A–1 | A–3 |
| D455 | A–2 | A–3 |
| D456 | A–1 | A–3 |
| D457 | A–1 | A–3 |
| D501 | C–2 | C–2 |
| D502 | C–2 | C–2 |
| D503 | C–2 | C–2 |
| D504 | C–2 | C–3 |
| D505 | C–2 | C–3 |
| D600 | D–3 | D–1 |
| D601 | C–3 | C–1 |
| D602 | C–3 | C–1 |
| D603 | C–3 | C–2 |
| D604 | C–3 | C–2 |
| D605 | C–3 | A–3 |
| D606 | B–3 | B–1 |
| D631 | D–2 | D–2 |
| D632 | B–3 | B–2 |
| D634 | D–2 | D–2 |
| D635 | D–3 | D–2 |
| D636 | D–2 | D–2 |
| D637 | D–3 | D–1 |
| D638 | D–2 | D–2 |
| D639 | D–3 | D–2 |
| D640 | D–3 | D–2 |
| D642 | C–2 | C–2 |
| D648 | D–3 | D–1 |
| D650 | D–3 | D–1 |
| D651 | C–3 | C–2 |
| D653 | D–3 | D–2 |
| D654 | D–3 | D–2 |
| D655 | B–3 | B–2 |
| D670 | C–3 | C–2 |
| D671 | B–3 | C–2 |
| D672 | C–3 | C–1 |
| D673 | C–3 | C–1 |
| D674 | C–3 | C–2 |
| D675 | C–3 | C–2 |
| D679 | B–3 | B–1 |
| D680 | B–3 | B–1 |
| D681 | B–3 | B–1 |
| D682 | B–3 | B–1 |
| D683 | B–3 | B–1 |
| D684 | B–3 | B–1 |
| D685 | B–3 | B–1 |
| D686 | B–3 | B–1 |
| D689 | E–3 | E–3 |
| D690 | D–3 | D–2 |
| D691 | B–3 | B–2 |
| D701 | B–2 | B–3 |
| D702 | B–2 | B–2 |
| D703 | B–2 | B–2 |
| D704 | B–2 | B–3 |
| D706 | D–2 | D–3 |
| D707 | D–2 | D–3 |
| D708 | C–1 | C–3 |
| D709 | A–2 | A–2 |
| D1402 | A–1 | A–3 |
| D1403 | C–1 | C–3 |
| D1404 | D–1 | D–3 |
| D1405 | D–1 | D–3 |
| D1406 | C–1 | C–3 |
| D1407 | C–1 | C–3 |

### VARIABLE RESISTOR

| | (Conductor) Side | (Component) Side |
|---|---|---|
| RV401 | C–2 | C–3 |
| RV601 | B–3 | B–1 |

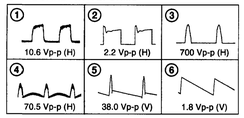


## ● D BOARD VOLTAGE LIST

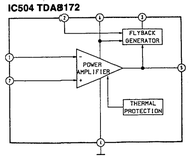
| Ref. | Pin No. | Voltage [V] |
|---|---|---|
| IC401 | 1 | 9.1 |
| | 2 | 9.9 |
| | 4 | 3.2 |
| | 5 | 7.5 |
| | 6 | 5.3 |
| | 7 | 7.5 |
| | 8 | 4.3 |
| | 9 | 5.0 |
| | 10 | 4.7 |
| | 11 | 7.4 |
| | 13 | 9.1 |
| | 14 | 10.8 |
| IC402 | 1 | 42.0 |
| | 2 | 42.0 |
| | 3 | 34.7 |
| | 4 | 41.6 |
| IC403 | 1 | 5.2 |
| | 2 | 6.2 |
| | 3 | 6.2 |
| | 5 | 6.4 |
| | 6 | 6.4 |
| | 7 | 6.5 |
| | 8 | 4.7 |
| | 9 | 5.0 |
| | 10 | 5.0 |
| | 12 | 8.7 |
| | 13 | 8.7 |
| | 14 | 8.7 |
| IC504 | 1 | 0.9 |
| | 2 | −13.6 |
| | 4 | −14.2 |
| | 5 | 0.3 |
| | 6 | 13.5 |
| | 7 | 0.9 |
| IC601 | 1 | 2.5 |
| | 2 | 2.5 |
| | 3 | 2.5 |
| | 4 | 0.5 |
| | 5 | 1.5 |
| | 6 | 3.3 |
| | 8 | 12.0 |
| | 9 | 3.2 |
| | 10 | 3.2 |
| | 11 | 11.9 |
| | 12 | 10.9 |
| | 13 | 4.9 |
| | 14 | 4.9 |
| | 15 | 4.9 |
| | 16 | 0 |
| IC602 | 1 | 2.5 |
| | 3 | 13.7 |
| IC603 | 1 | 0 |
| | 2 | 2.5 |
| | 3 | 6.2 |
| | 4 | 5.0 |
| | 5 | 7.4 |
| IC606 | IN | 7.8 |
| | OUT | 5.0 |
| IC607 | IN | −14.8 |
| | OUT | −5.0 |
| IC608 | IN | 14.7 |
| | OUT | 12.0 |
| IC609 | IN | 12.0 |
| | OUT | 5.0 |
| IC630 | 1 | 179.8 |
| | 3 | 13.9 |
| | 4 | 0 |
| IC701 | 1 | −0.7 |
| | 2 | −0.8 |
| | 3 | 1.5 |
| | 4 | 1.5 |
| | 6 | 1.8 |
| | 7 | 1.8 |
| | 8 | −0.2 |
| | 9 | −0.2 |
| | 10 | 14.6 |
| IC702 | 2 | 4.0 |
| | 3 | 0 |
| | 4 | 4.0 |
| | 5 | 0 |
| | 6 | 3.9 |
| | 7 | 0 |
| | 8 | 3.9 |
| | 9 | 0 |
| | 10 | 3.9 |
| | 11 | 0 |
| IC1401 | 1 | −10.3 |
| | 2 | 2.5 |
| | 3 | 2.5 |
| PH670 | 1 | 1.2 |
| | 2 | 0.1 |
| | 3 | 0 |
| | 4 | 0.4 |
| PH675 | 1 | 4.9 |
| | 2 | 4.5 |
| | 3 | 0 |
| | 4 | 2.6 |
| Q401 | B | 5.2 |
| | E | 5.3 |
| Q402 | B | 5.2 |
| | C | 14.4 |
| | E | 5.3 |
| Q403 | B | −14.3 |
| | C | −0.2 |
| | E | −14.2 |
| Q404 | B | 0.5 |
| | C | 0.8 |
| Q405 | B | 9.1 |
| | E | 8.7 |
| Q406 | B | 9.1 |
| | E | 8.7 |
| Q407 | B | −1.0 |
| | C | 42.2 |
| Q408 | G | 178.3 |
| | D | 43.3 |
| | S | 179.9 |
| Q409 | B | 10.2 |
| | C | 0 |
| Q410 | B | 0 |
| | C | 11.9 |
| | E | 0 |
| Q411 | B | 0.5 |
| | C | 38.0 |
| | E | 0 |
| Q413 | B | 0.7 |
| | C | 0.2 |
| Q414 | B | 9.1 |
| | E | 8.9 |
| Q415 | B | 9.1 |
| | E | 8.9 |
| Q416 | B | 0 |
| | C | 7.5 |
| Q417 | G | 176.9 |
| | D | 42.0 |
| | S | 179.9 |
| Q418 | B | 9.9 |
| | E | 9.8 |
| Q419 | B | 9.9 |
| | E | 9.8 |
| Q420 | G | 9.9 |
| | D | 42.0 |
| Q423 | B | 7.5 |
| | E | 8.3 |
| Q424 | B | 10.3 |
| | C | 7.5 |
| | E | 10.9 |
| Q425 | B | 4.8 |
| | C | 0 |
| Q426 | B | 0 |
| | C | 5.2 |
| | E | 5.2 |
| Q600 | G | 3.0 |
| | D | 91.2 |
| | S | 0 |
| Q601 | B | 3.2 |
| | C | 0 |
| | E | 3.0 |
| Q602 | B | 1.2 |
| | C | −0.6 |
| | E | 2.0 |
| Q603 | B | 0.1 |
| | C | 4.9 |
| | E | 0 |
| Q604 | B | 5.6 |
| | C | 2.5 |
| | E | 4.9 |
| Q605 | B | 1.0 |
| | C | 0.4 |
| | E | 0.4 |
| Q606 | B | 4.9 |
| | C | 0.5 |
| | E | 4.9 |
| Q608 | B | 180.0 |
| | C | 0 |
| | E | 180.1 |
| Q609 | B | 1.6 |
| | C | 0 |
| | E | 1.5 |
| Q610 | B | 0 |
| | C | 1.5 |
| | E | 0 |
| Q640 | B | 14.0 |
| | E | 13.9 |
| Q641 | B | 0.2 |
| | C | 14.0 |
| Q642 | B | 1.2 |
| | C | 0 |
| | E | 1.2 |
| Q643 | B | 0.7 |
| | C | 0.1 |
| Q644 | B | 0 |
| | C | 1.2 |
| Q645 | B | 201.0 |
| | C | 396.0 |
| | E | 202.1 |
| Q647 | B | −0.6 |
| | C | 202.1 |
| | E | 0 |
| Q648 | B | −0.7 |
| | C | −0.6 |
| | E | 0 |
| Q649 | B | 15.2 |
| | C | 15.9 |
| | E | 15.9 |
| Q671 | B | 0 |
| | C | 4.4 |
| Q672 | B | 11.3 |
| | C | 11.9 |
| | E | 12.1 |
| Q674 | B | 191.0 |
| | C | 396.0 |
| | E | 194.3 |
| Q675 | B | −2.1 |
| | C | 194.3 |
| | E | 0 |
| Q686 | B | 0 |
| | C | 14.8 |
| Q702 | B | 3.2 |
| | C | 186.1 |
| | E | 2.7 |
| Q703 | B | 2.7 |
| | E | 3.2 |
| Q704 | G | −0.6 |
| | D | −0.1 |
| Q1401 | B | 4.4 |
| | E | 3.8 |
| Q1402 | B | 0.7 |
| | C | 0 |
| Q1403 | B | −10.5 |
| | C | 8.0 |
| | E | −11.1 |
| Q1404 | B | 11.8 |
| | C | 2.5 |



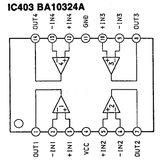
## ● D BOARD WAVEFORMS

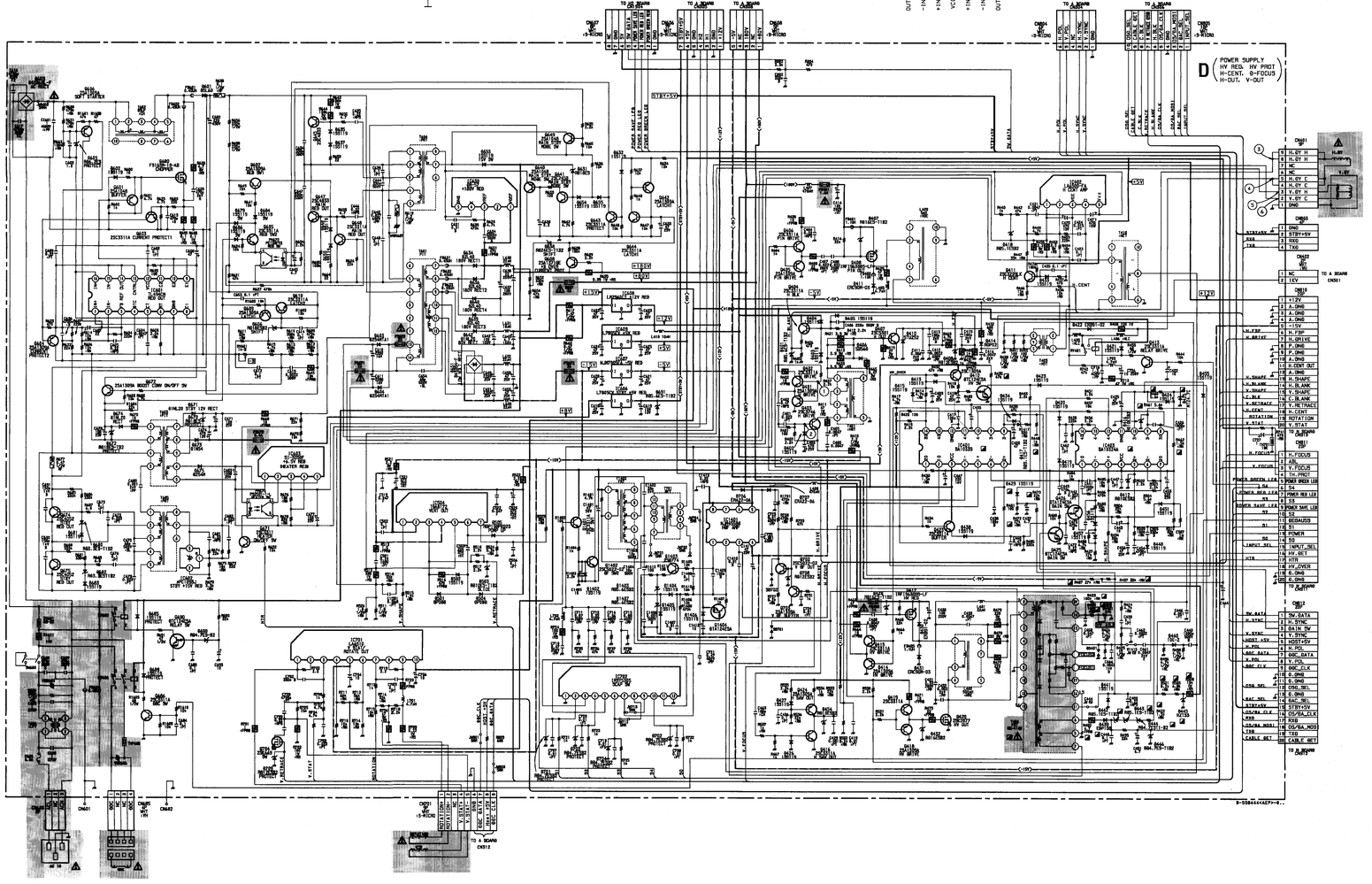



## ● D BOARD IC504 TDA8172




## ● D BOARD IC403 BA10324A



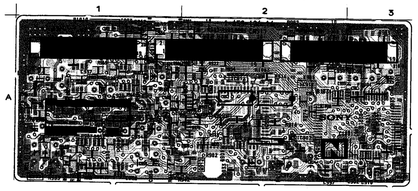
## (2) Schematic Diagrams of A, N Boards

### ● N BOARD VOLTAGE LIST

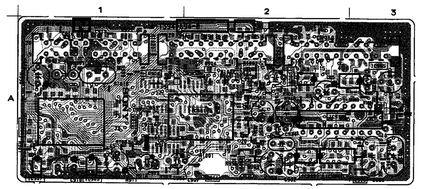
| Ref. | Pin No. | Voltage [V] | Ref. | Pin No. | Voltage [V] |
|---|---|---|---|---|---|
| IC902 | 3 | 0.2 | | 10 | 5.0 |
| | 4 | 2.5 | | 11 | 0.5 |
| | 6 | 0.4 | | 12 | 0.1 |
| | 7 | 0.4 | | 13 | 4.5 |
| | 9 | 1.3 | Q901 | B | 5.1 |
| | 11 | 1.3 | | E | 5.1 |
| | 12 | 4.5 | Q902 | B | 5.1 |
| | 13 | 1.3 | | E | 5.1 |
| | 14 | 0.4 | Q903 | B | 0.4 |
| IC911 | 1 | 5.0 | | E | 0.4 |
| | 2 | 4.8 | Q905 | B | 1.1 |
| | 3 | 0.3 | | E | 0.7 |
| | 6 | 0.1 | Q905 | B | 1.1 |
| | 9 | 4.9 | | E | 0.7 |
| | 11 | 0.3 | Q908 | C | 5.0 |
| | 12 | 4.9 | Q910 | G | 0.4 |
| | 13 | 5.0 | | D | * |
| IC912 | 1 | 0.3 | Q912 | B | 0.2 |
| | 2 | 4.7 | | C | 6.7 |
| | 3 | 4.7 | | | |
| | 4 | 5.0 | | | |
| | 5 | −0.2 | | | |
| | 6 | 0 | | | |
| | 8 | 0.3 | | | |
| | 9 | 0.3 | | | |

**N** SYSTEM CONT / EEP ROM / POWER SAVE

— N BOARD (Conductor side) —



— N BOARD (Component side) —



* : Pattern from the side which separates the foil.
* ▒▒▒ : Pattern of the rear side.

### ● N BOARD SEMICONDUCTOR LOCATION

| IC | (Conductor Side) | (Component Side) |
|---|---|---|
| IC901 | A–1 | |
| IC902 | A–2 | |
| IC903 | | A–1 |
| IC904 | | A–1 |
| IC905 | | A–3 |
| IC906 | | A–2 |
| IC907 | | A–1 |
| IC908 | A–3 | A–2 |
| IC909 | | A–2 |
| IC911 | A–2 | |
| IC912 | A–2 | |
| IC913 | A–1 | A–2 |

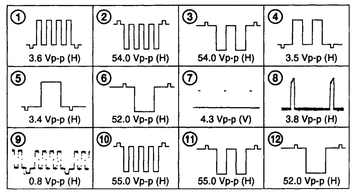
| TRANSISTOR | (Conductor Side) | (Component Side) | * |
|---|---|---|---|
| Q901 | A–1 | | ① |
| Q902 | A–1 | | ① |
| Q903 | A–2 | | ① |
| Q904 | | A–1 | ② |
| Q905 | A–1 | | ① |
| Q907 | | A–3 | ② |
| Q908 | A–3 | | ① |

| | (Conductor Side) | (Component Side) | * |
|---|---|---|---|
| Q909 | A–2 | | ② |
| Q910 | | A–1 | ② |
| Q911 | | A–2 | ② |
| Q912 | A–2 | | ① |

| DIODE | (Conductor Side) | (Component Side) | * |
|---|---|---|---|
| D901 | A–2 | | ② |
| D902 | | A–3 | ② |
| D903 | | A–1 | ② |
| D904 | | A–2 | ② |
| D905 | | A–2 | ② |
| D906 | | A–3 | ② |
| D907 | A–1 | | ① |
| D908 | | A–2 | ② |
| D909 | | A–2 | ② |
| D917 | A–2 | | ① |
| D920 | A–3 | | ① |

| CRYSTAL | (Conductor Side) | (Component Side) |
|---|---|---|
| X901 | A–2 | A–1 |

### ● A BOARD WAVEFORMS

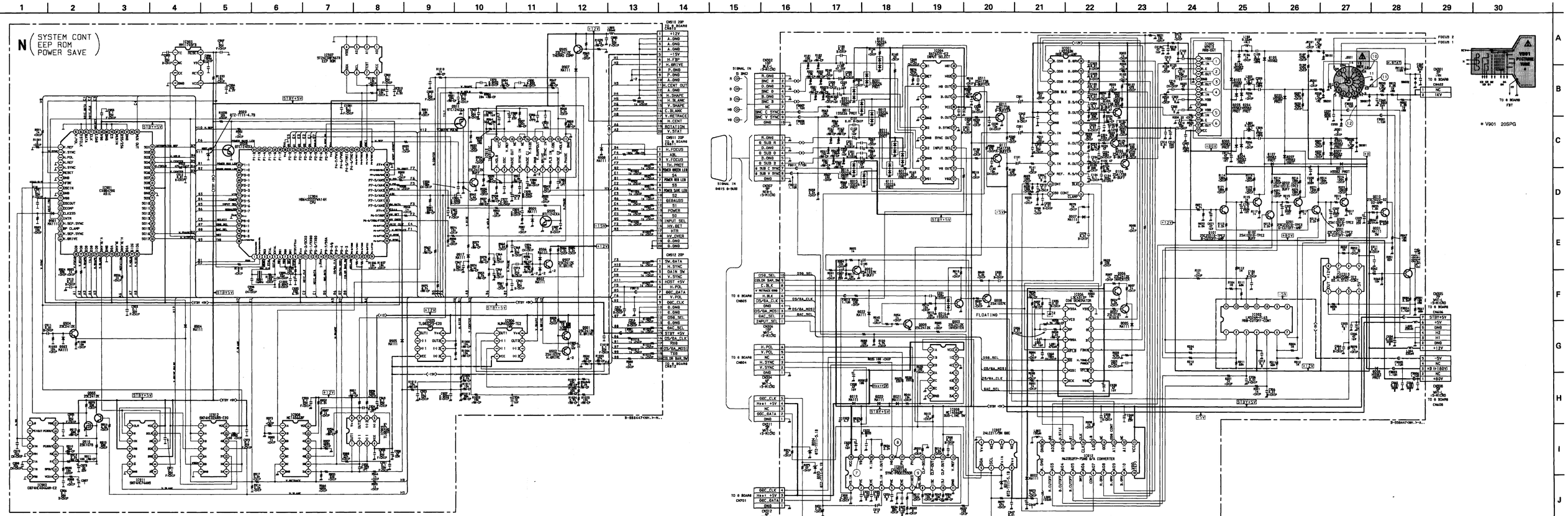



### ● A BOARD VOLTAGE LIST

| Ref. | Pin No. | Voltage [V] | Ref. | Pin No. | Voltage [V] | Ref. | Pin No. | Voltage [V] | Ref. | Pin No. | Voltage [V] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IC001 | 1 | 0 | | 14 | 4.9 | IC007 | 5 | 0.5 | Q102 | B | 91.1 |
| | 2 | 0 | | 15 | 0 | | 6 | 4.3 | | C | 0.8 |
| | 3 | 0 | | 16 | 5.0 | | 7 | 0 | | E | 91.6 |
| | 4 | 0 | | 17 | 5.0 | | | | | | |
| | 5 | 2.3 | | 18 | 0.7 | Q002 | B | 2.5 | Q104 | B | 1.9 |
| | 11 | 2.2 | | 19 | 1.3 | | E | 3.1 | | E | 2.7 |
| | 12 | 2.0 | | 20 | 1.3 | Q003 | B | 0 | Q201 | B | 7.0 |
| | 13 | 1.8 | | 21 | 0.3 | | C | 2.7 | | C | 95.0 |
| | 14 | 1.5 | | | | | | | | E | 6.4 |
| | 15 | 3.8 | IC005 | 1 | 9.8 | Q004 | B | 3.5 | Q202 | B | 95.0 |
| | 16 | 4.5 | | 2 | 2.7 | | C | 0 | | C | 0.7 |
| | 17 | 7.2 | | 3 | 2.0 | Q005 | B | 0 | | E | 95.6 |
| | 18 | 1.9 | | 4 | 49.9 | | C | 4.9 | | | |
| | 19 | 7.2 | | 6 | 51.4 | | | | Q204 | B | 1.8 |
| | 20 | 1.8 | | 7 | 1.9 | Q006 | B | −0.7 | | E | 2.6 |
| | 23 | 1.9 | | 8 | 2.6 | | C | 2.5 | | | |
| | 24 | 7.2 | | 9 | 9.8 | | | | Q301 | B | 7.0 |
| | 25 | 0.9 | | 11 | 9.9 | Q007 | B | 0.7 | | C | 97.8 |
| | 26 | 3.1 | | 12 | 2.6 | | C | 0.2 | | E | 6.5 |
| | 27 | 3.1 | | 13 | 1.9 | | | | | | |
| | 28 | 3.0 | | 14 | 51.0 | Q008 | B | 4.6 | Q302 | B | 97.8 |
| IC003 | 1 | 7.2 | IC006 | 1 | 0 | | E | * | | C | 0.6 |
| | 2 | 0.2 | | 2 | 1.5 | Q010 | B | 9.5 | | E | 98.4 |
| | 3 | 3.7 | | 3 | 1.5 | | C | 319.3 | Q304 | B | 1.9 |
| | 4 | 4.2 | | 5 | 2.6 | | E | 9.0 | | E | 2.6 |
| | 5 | 0.5 | | 6 | 4.7 | | | | | | |
| | 6 | 2.6 | | 7 | 4.8 | Q060 | B | 10.8 | J001 | KR | 64.8 |
| | 7 | 1.5 | | 8 | 4.8 | | C | 301.2 | | KG | 69.7 |
| | 8 | 5.0 | | 10 | 3.5 | | E | 10.2 | | KB | 72.7 |
| | 9 | 1.3 | | 12 | 0 | | | | | G2 | 324.0 |
| | 10 | 1.3 | | 13 | 0 | Q101 | B | 7.0 | | H1 | 6.2 |
| | 12 | 3.2 | | 14 | 0 | | C | 91.1 | | | |
| | 13 | 0.3 | | 15 | 0 | | E | 6.4 | | | |

**Terminal name of semiconductors in silk screen printed circuit (*)**

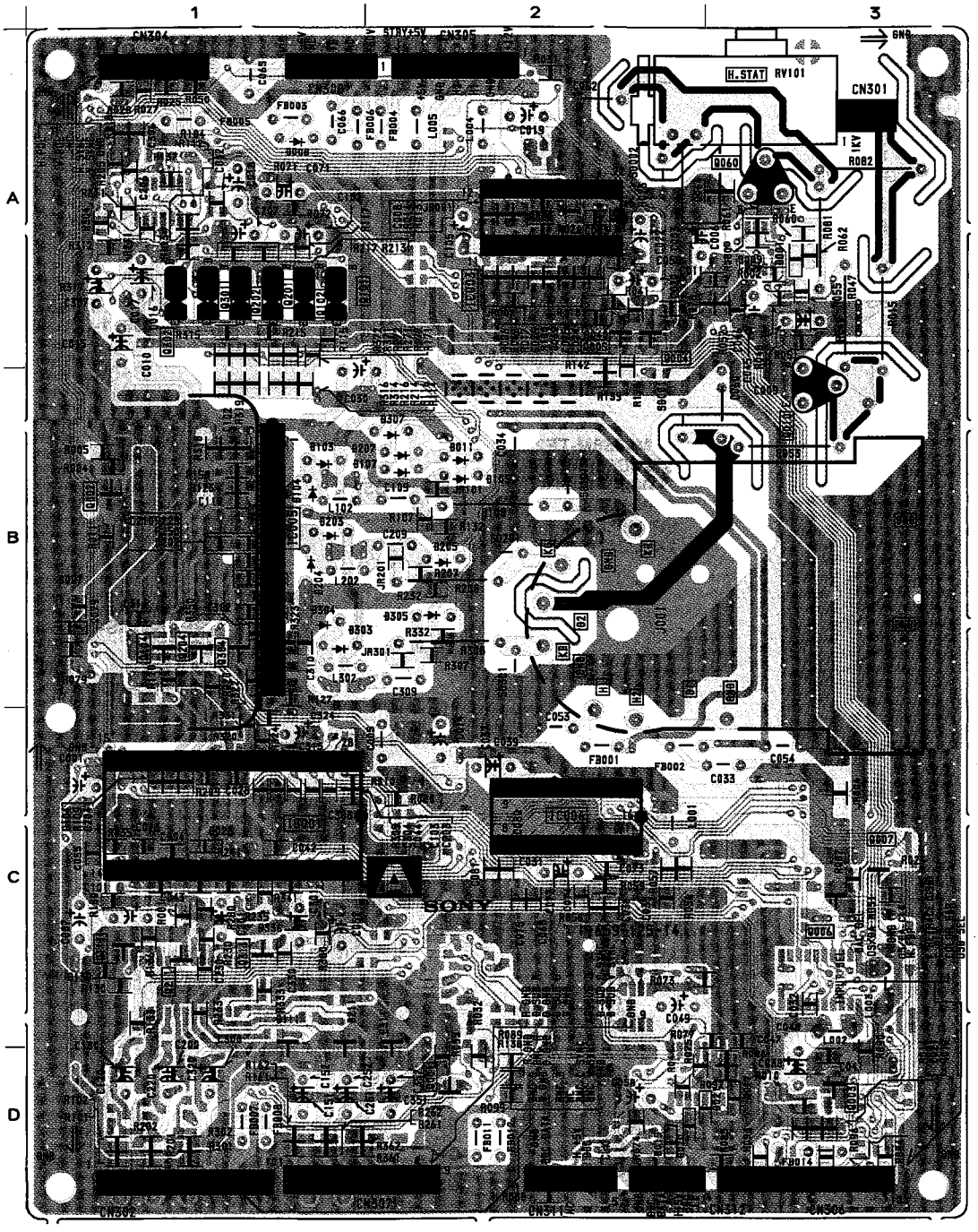
| | Device | Printed symbol | Terminal name | Circuit |
|---|---|---|---|---|
| ① | Transistor | T | Collector / Base / Emitter | |
| ② | Transistor | — | Collector / Base / Emitter | |
| ③ | Diode | | Cathode / Anode | |
| ④ | Transistor (FET) | | Source / Drain / Gate | |
| – | Discrete semiconductor | | | |




Schematic diagram ← D board

Schematic diagrams A N boards →

## — A BOARD (Conductor side) —




▫ ▒▒▒ : Pattern from the side which enables seeing.
• ▒▒▒ : Pattern of the rear side.

**NOTE:**
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

## ● A BOARD SEMICONDUCTOR LOCA

### IC

| | (Conductor Side) | (Component Side) |
|---|---|---|
| IC001 | C–1 | C–3 |
| IC002 | | A–3 |
| IC003 | A–2 | A–2 |
| IC004 | | C–3 |
| IC005 | B–1 | B–3 |
| IC006 | C–2 | C–2 |
| IC007 | | C–1 |
| IC008 | | D–1 |
| IC010 | | A–1 |
| IC012 | | C–1 |

### TRANSISTOR

| | (Conductor Side) | (Component Side) | * |
|---|---|---|---|
| Q002 | B–1 | | ① |
| Q003 | D–3 | | ① |
| Q006 | C–3 | | ① |
| Q007 | C–3 | | ① |
| Q008 | | D–1 | ② |
| Q009 | | C–1 | ② |
| Q010 | B–3 | B–1 | – |
| Q060 | A–3 | A–1 | – |
| Q101 | A–1 | A–2 | – |
| Q102 | A–1 | A–2 | – |
| Q104 | B–1 | | ① |
| Q111 | C–1 | | ① |
| Q201 | A–1 | A–3 | – |
| Q202 | A–1 | A–3 | – |
| Q204 | B–1 | | ① |
| Q211 | C–1 | | ① |
| Q301 | A–1 | A–3 | – |
| Q302 | A–1 | A–3 | – |
| Q304 | B–1 | | ① |
| Q311 | C–1 | | ① |

### DIODE

| | (Conductor Side) | (Component Side) | * |
|---|---|---|---|
| D001 | A–3 | | ③ |
| D002 | | | C–1 |
| D003 | | | D–1 |
| D004 | | | D–2 |
| D005 | | | C–1 |
| D007 | B–1 | | |
| D008 | A–1 | | A–2 |
| D011 | B–2 | | B–2 |
| D012 | | | C–2 |
| D013 | | | C–2 |
| D014 | | | C–2 |
| D015 | | | C–2 |
| D016 | | | D–1 |
| D018 | | | C–1 |
| D019 | D–2 | | |
| D020 | D–2 | | |
| D021 | D–2 | | |
| D022 | | | D–1 |
| D101 | | | D–3 |
| D103 | B–1 | | B–2 |
| D104 | B–1 | | B–2 |
| D105 | B–2 | | B–2 |
| D107 | B–1 | | B–2 |
| D111 | C–1 | | |
| D201 | | | D–3 |
| D203 | B–1 | | B–2 |
| D204 | B–1 | | B–2 |
| D205 | B–2 | | B–2 |
| D207 | B–1 | | B–2 |
| D211 | C–1 | | |
| D301 | | | D–3 |
| D303 | B–1 | | B–2 |
| D304 | B–1 | | B–2 |
| D305 | B–2 | | B–2 |
| D307 | B–2 | | B–2 |
| D311 | C–2 | | |

### VARIABLE RESIS

| | (Conductor Side) | (Co |
|---|---|---|
| RV101 | A–3 | A–1 |

### Terminal name of semiconductors in sill printed circuit (*)

| | Device | Printed symbol | Terminal name |
|---|---|---|---|
| ① | Transistor | | Collector Base Emitter |
| ② | Transistor |  | Collector Base Emitter |
| ③ | Diode | | Cathode Ano |
| ④ | Diode | | Common Anode Cathoc |
| ⑤ | Diode | | Common Anode Cathod |
| – | Discrete semiconductor | | |

EO AMP,
B OUT

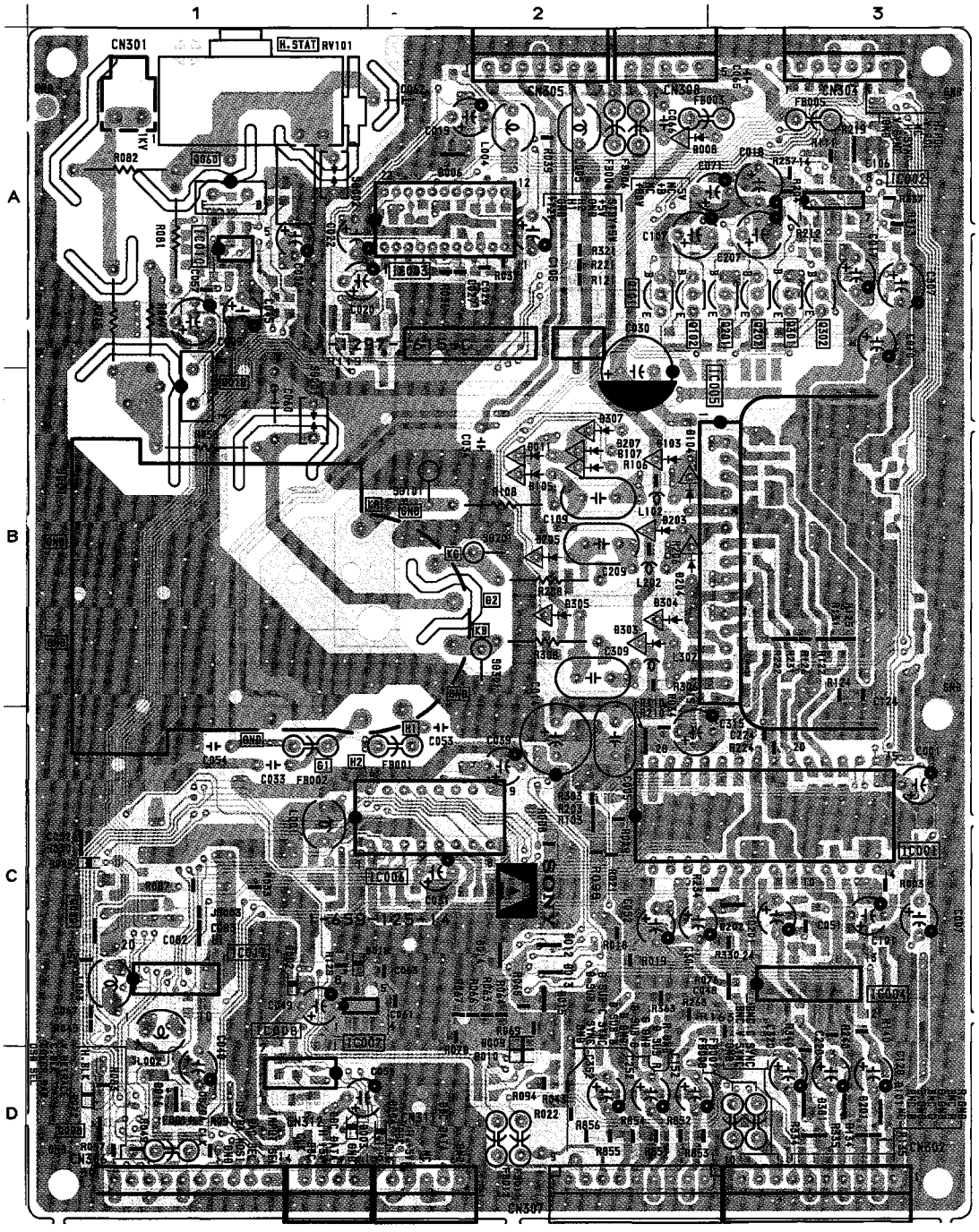
## SEMICONDUCTOR LOCATION

| | | | |
|---|---|---|---|
| (Component Side) | | | |
| C–3 | D002 | C–1 | ③ |
| A–3 | D003 | D–1 | ③ |
| A–2 | D004 | D–2 | ③ |
| C–3 | D005 | C–1 | ③ |
| B–3 | D007 | B–1 | ③ |
| C–2 | D008 | A–1 | A–2 – |
| C–1 | D011 | B–2 | B–2 – |
| D–1 | D012 | | C–2 ⑤ |
| A–1 | D013 | | C–2 ⑤ |
| C–1 | D014 | | C–2 ⑤ |
| | D015 | | C–2 ⑤ |
| | D016 | | D–1 ⑤ |
| | D018 | | C–1 ③ |
| | D019 | D–2 | ③ |
| | D020 | D–2 | ③ |
| | D021 | D–2 | ③ |
| TOR | D022 | | D–1 ③ |
| (Component Side) * | D101 | | D–3 ⑤ |
| ① | D103 | B–1 | B–2 – |
| ① | D104 | B–1 | B–2 – |
| ① | D105 | B–2 | B–2 – |
| ① | D107 | B–1 | B–2 – |
| D–1 ② | D111 | C–1 | ④ |
| C–1 ② | D201 | | D–3 ⑤ |
| B–1 – | D203 | B–1 | B–2 – |
| A–1 – | D204 | B–1 | B–2 – |
| A–2 – | D205 | B–2 | B–2 – |
| A–2 – | D207 | B–1 | B–2 – |
| ① | D211 | C–1 | ④ |
| ① | D301 | | D–3 ⑤ |
| A–3 – | D303 | B–1 | B–2 – |
| A–3 – | D304 | B–1 | B–2 – |
| ① | D305 | B–2 | B–2 – |
| ① | D307 | B–2 | B–2 – |
| A–3 – | D311 | C–2 | ④ |
| A–3 – | | | |
| ① | VARIABLE RESISTOR | | |
| ① | | (Conductor Side) | (Component Side) |
| | RV101 | A–3 | A–1 |
| (Component Side) * | | | |
| ③ | | | |

## e of semiconductors in silk screen (*)

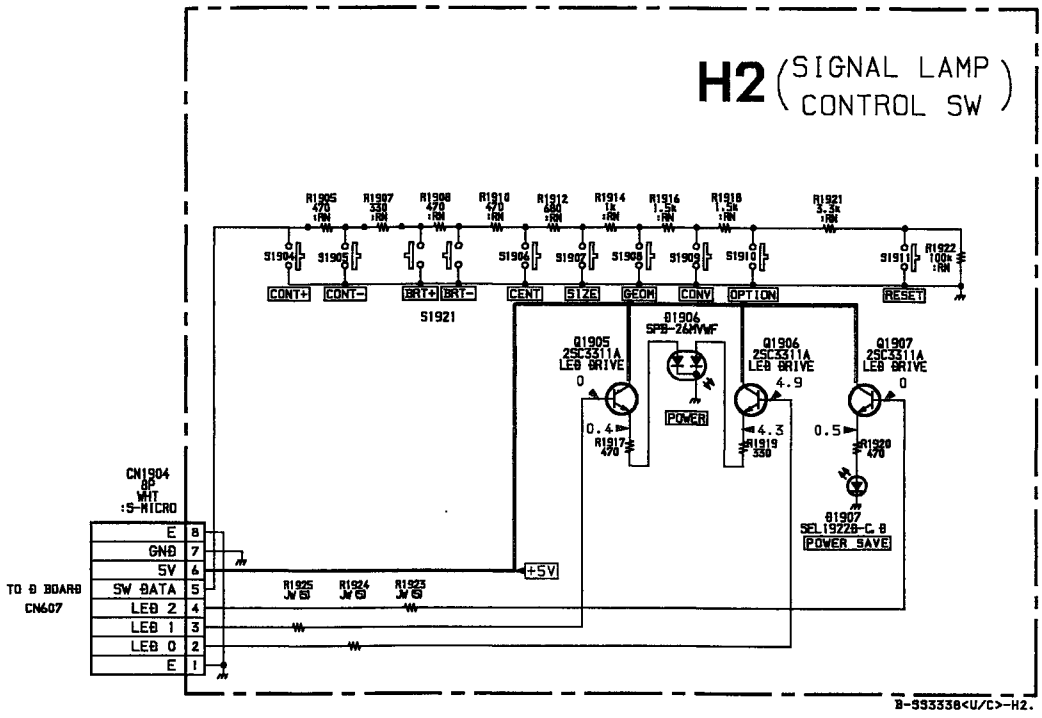
| Printed symbol | Terminal name | Circuit |
|---|---|---|
| T | Collector / Base T Emitter | |
| — | Collector / Base — Emitter | |
| | Cathode — Anode | |
| T | Common / Anode T Cathode | |
| — | Common / Anode — Cathode | |
| onductor | | |

## — A BOARD (Component side) —

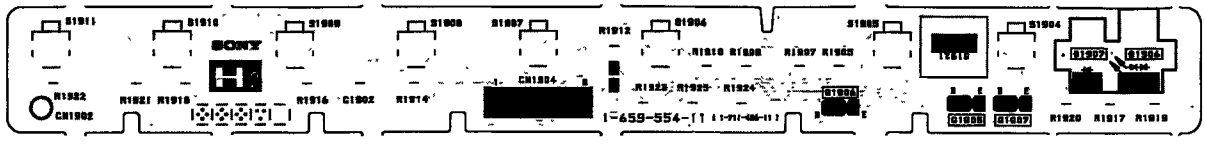



◦ ▒▒▒ : Pattern from the side which enables seeing.
• ▒▒▒ : Pattern of the rear side.

### (3) Schematic Diagram of H2 Board



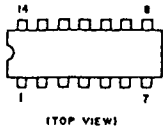

### — H2 BOARD —



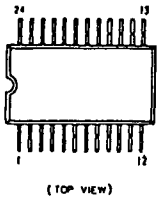

**Schematic diagram**
**H2 board**

## 5-4. SEMICONDUCTORS

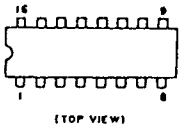
**BA10324**
**BA10324A**
**BA10339**



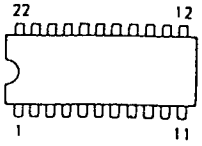

**BA7657F-E2**




**CD74HC4046AM**
**CD74HC4046AM-E2/SO**
**LSC4312P**
**TL494CN**

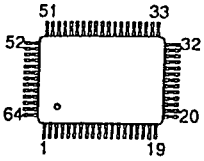



**CXA2016S**



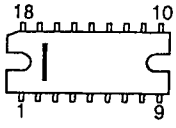
*(Top view)*

**CXD8478Q**



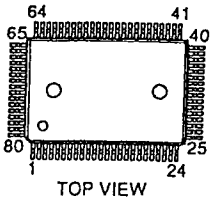
TOP VIEW

**DM-57**



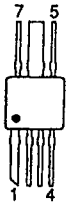
TOP VIEW

**HD6433337WA14H**



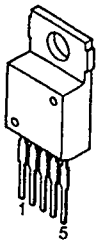
TOP VIEW

**IRSY5305**

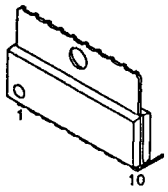


MARKING SIDE VIEW

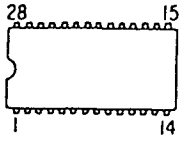
**LA6500-FA**




**LA6510**

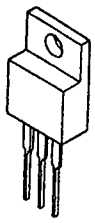



**LM2283N**

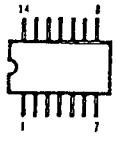


*(Top view)*

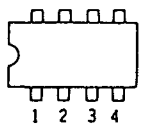
**LM2940CT**
**L7805CV**
**TA7805S**
**µPC24M12AHF**



**LM324M**
**LM324M-FL63**
**MC14066BF**
**SN74HC02ANS**
**SN74HC02ANS-E20**
**SN74HC74ANS**
**SN74HC74ANS-E20**

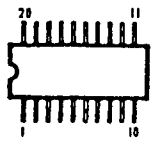



**MM1170BFB**
**M5218AP**
**NJM4558D**

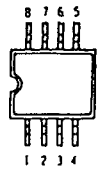


(Top view)

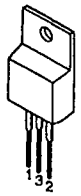
**M62352FP**
**M62352FP-75ND**



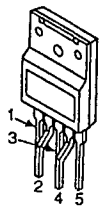

**NJM4558M-TE2**
**ST24C08FM6TR**
**TL082CPS-E20**
**TL082M**
**µPC4558G2**
**24LC21T/SN**



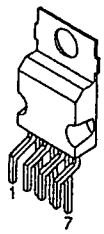

**NJM7905FA**



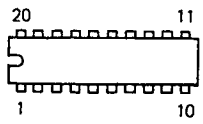

**SI-3050F**




**TDA8172**

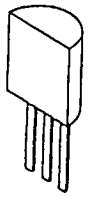



**TDA9102C**

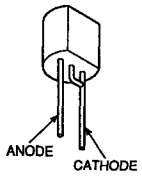


*(Top view)*

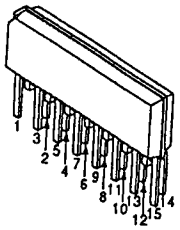
**µPC1093J**



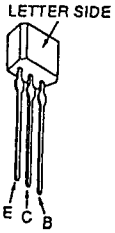
**µPC574J**



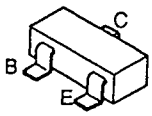

**VPS12**



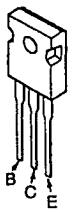

**DTA124ESA**
**DTC124ESA**
**2SA1048-YGR**
**2SA1175-HFE**
**2SA1309A-QRSTA**
**2SC2785-HFE**
**2SC3311A-QRSTA**



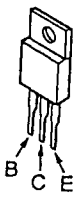

**DTC124EKA-T146**
**2SA1037K-T-146-QR**
**2SA1162-G**
**2SA1462-Y33**
**2SA1738-(TX)**
**2SC1623-L5L6**
**2SC2412K-T-146-QR**
**2SC3735-L-B35**
**2SC3735-T1B-B34**



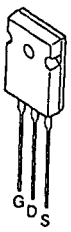

**FS16SM-10-A8**
**2SC5301-CC**



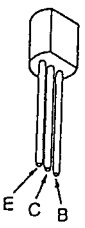

**IRFI9630GS**
**IRFI9630GS-LF**
**2SC3746**
**2SC4686A(LB SONY)**
**2SC5022-02**



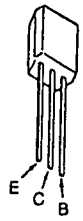

**IRFPG50LF21**
**2SK2077(LB SONY)**



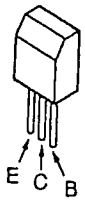

**2SA1091-O**
**2SA1371DE-AE**
**2SC2551-O**



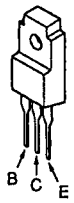
**2SC2458-YGR**



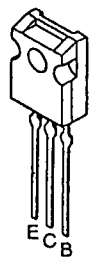

**2SC3209LK**
**2SD774-34**



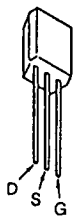

**2SC4052MNPR**



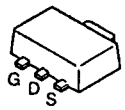

**2SC4833MNP**



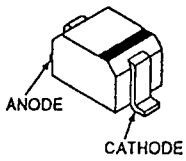

**2SK669**



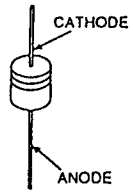

**2SK1078**



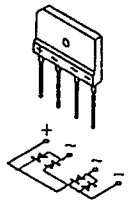

**DTZ-TT11-4.7B**
**DTZ-TT11-5.1B**
**DTZ4.7C**
**DTZ5.1B**
**MA111**
**UDZ-TE-17-4.7B**
**UDZ-TE-17-5.1B**



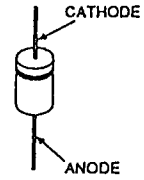

**D1NL20-TR**
**D1NS4**
**EGP10G**
**ERA22-06**
**MTZJ-T-77-4.7C**
**MTZJ-4.7C**
**RD10ES-B2**
**RD12ES-B2**
**RD16ES-B2**
**RD16ES-B3**
**RD18ES-B2**
**RD24ES-B2**
**RD24ES-B3**
**RD3.3ES-B2**
**RD4.7ES-B2**
**RD5.1ES-B2**
**RD5.6ES-B2**
**RD6.2ES-B2**
**RD9.1ES-B2**
**1SS119-25**




**D2L40-TA**
**D4SBS4-F**
**D4SB60L-F**

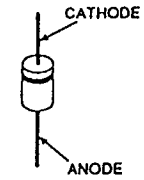


**D2S4MF**
**D2S4MTA1**
**EGP20G**
**ERA22-06**
**ERA22-08**
**ERB91-02**
**GP08D**
**GP08DPKG23**
**HSS82**
**HZT33-02**
**RGP02-20EL-6394**
**RGP15G**
**10E2**

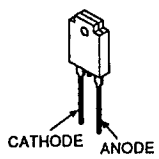



**D5L60**

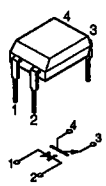
**EGP10D**
**S2LA20F**



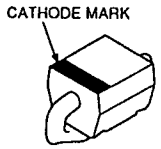

**ERC90M-03**



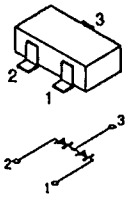

**PC123F2**
**PC123FY2**
**PS2501-1-L**



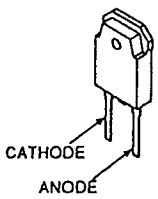

**SB560**



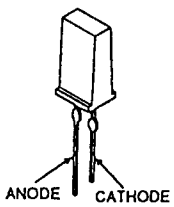

**1SS226**



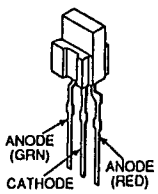

**5TUZ52**




**SEL1922D-C**
**SEL1922D-C,D**

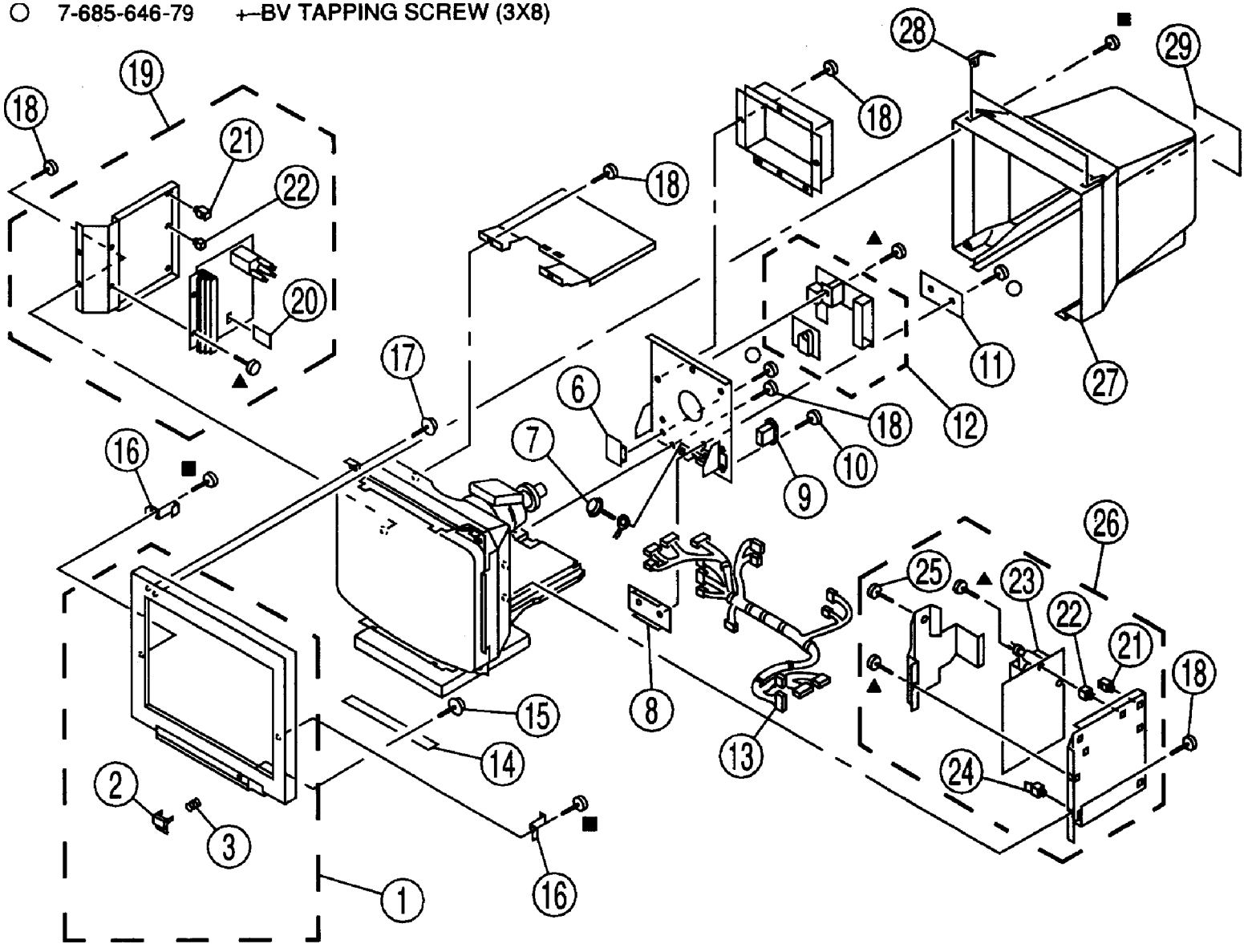



**SPB-26MVWF**



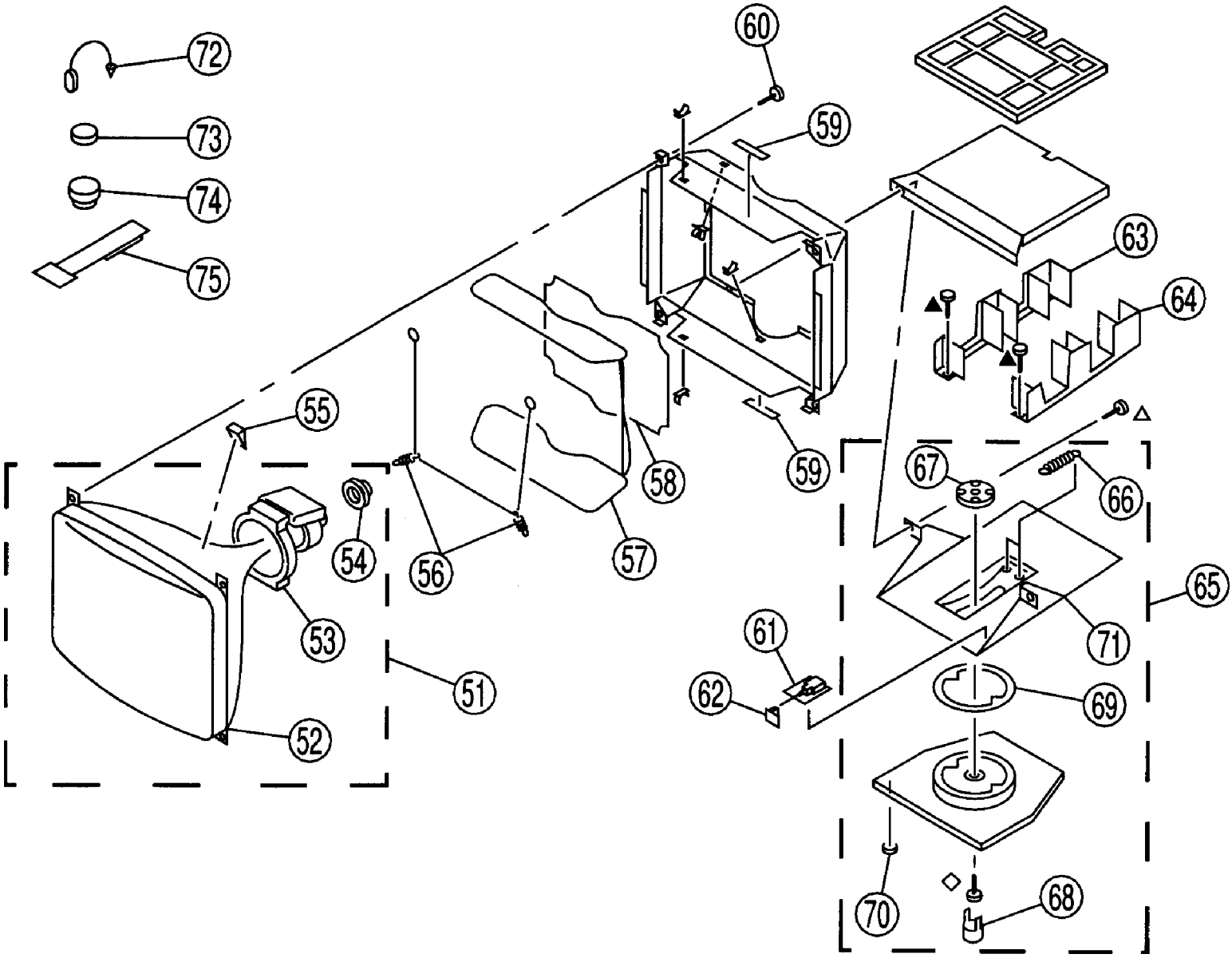
## 6-1. CHASSIS

■ 7-685-663-79 +–BV TAPPING SCREW (4X16)
▲ 7-685-647-79 +BVTP 3X10
○ 7-685-646-79 +–BV TAPPING SCREW (3X8)

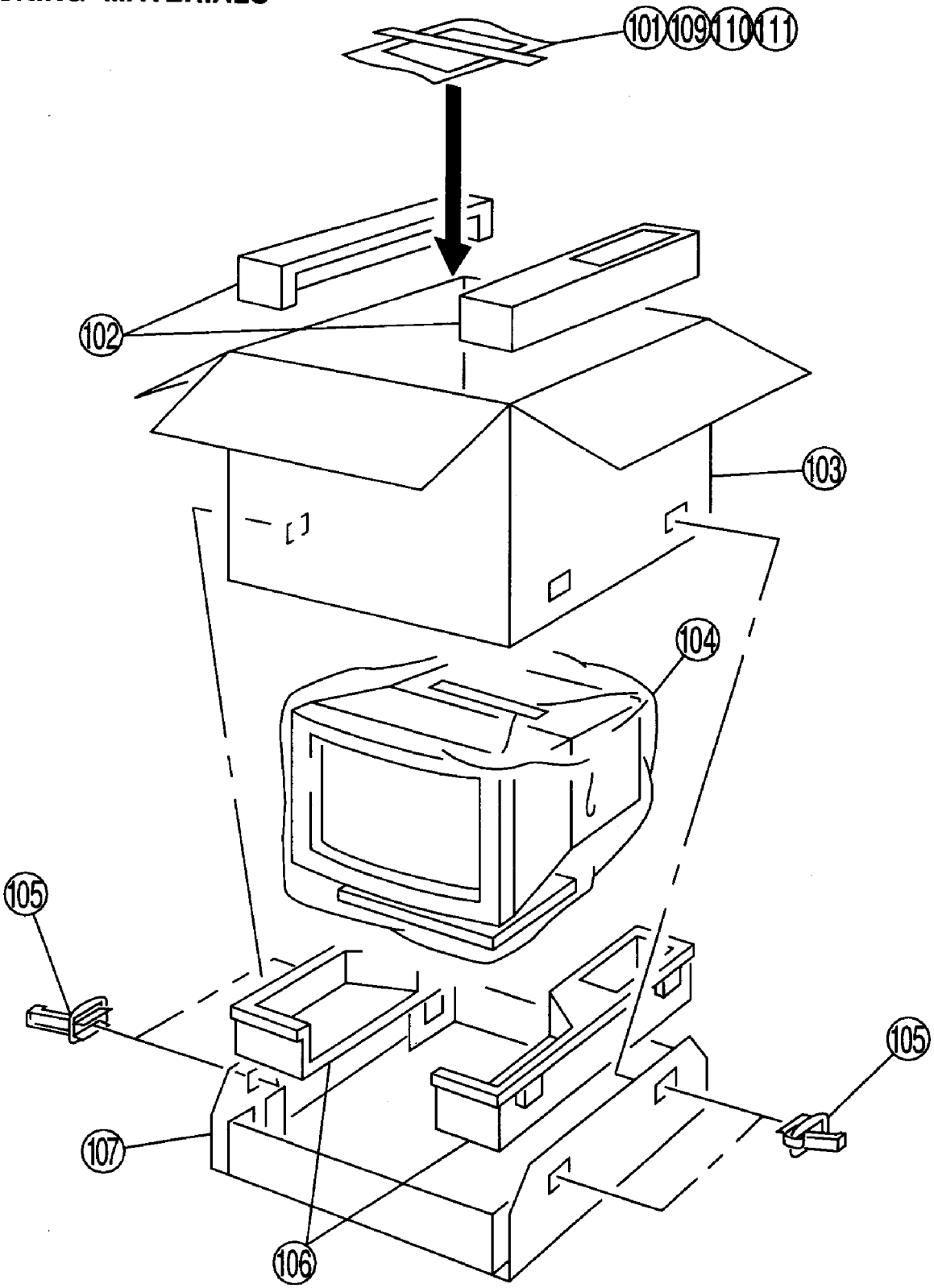


## 6-2. PICTURE TUBE

◇ 7-685-664-79 +BVTP 4X20
△ 7-682-563-04 +–BV TAPPING SCREW (M4X12)
▲ 7-685-647-79 +BVTP 3X10



## 6-3. PACKING MATERIALS



# GDM-20SE2T5

SONY

# SERVICE MANUAL

*AEP Model*

*Serial No, 2,350,001 and later*
*Chassis No. SCC-J53D-A*

# SUPPLEMENT-1

File this supplement with the service manual.

**SUBJECT : ADD to L BOARD**

## TABLE OF CONTENTS


| Section | Title | Page |
|---|---|---|
| **4.** | **ADJUSTMENTS** | 3 |
| **5.** | **DIAGRAMS** | |
| 5-1. | Block Diagram | 5 |
| 5-2. | Frame Schematic Diagram | 8 |
| 5-3. | Circuit Boards Location | 10 |
| 5-4. | Schematic Diagrams and Printed Wiring Boards | 10 |
| (1) | Schematic Diagram of D Board | 11 |
| (2) | Schematic Diagrams of G and L Boards | 15 |
| **6.** | **EXPLODED VIEWS** | |
| 6-2. | Picture Tube | 19 |
| 6-3. | Packing Materials | 20 |
| **7.** | **ELECTRICAL PARTS LIST** | |
| | L Board | 21 |
| | MISCELLANEOUS | 22 |


MICROFILM

# SECTION 4
# ADJUSTMENTS

## • Landing Rough Adjustment

1. Enter the full white signal. (or the full black dots signal).
2. Adjust the contrast to the maximum.
3. Make the screen monogreen.
4. Adjust the brightness is easy to see with the G2 resistor.
5. Reverse the DY, and adjust coarsely the purity magnet so that a green raster positions in the center of screen.
6. Moving the DY forward, adjust so that an entire screen becomes monogreen.
7. Adjust the tilt of DY, and fix lightly with a clamp.

## • Landing Fine Adjustment

1. Put the set inside the Helmholtz coil.
2. Input the single green signal and set the CONT control to MAX.

Note: After the W/B adjustment with 9300K, measure an average of ΣIk when a full white signal is entered in the CONT MAX/BRT CENT status. Then make adjustment so that the specified screen can be attained after aging for 2 hours with Ik equivalent to 30% of the average value.

3. Demagnetize the metal part of the chassis with the hand degausser and coil degausser, and the CRT surface with the hand degausser.
   Input AC 230V to AC IN, turn on and off the power to perform auto degaussing. (Perform auto degaussing by setting "MONCONREG2"=152. Return to the original value after use.)
   Demagnetize the CRT surface with the hand degausser again.

Note:
(1) The power must be turned off during chassis degaussing.
(2) Adjust in a non-magnetic field. BV=45uT.
(3) If adjusting in a magnetic fields, add the shift from the non-magnetic field in your estimation.

4. Attach the wobbling coil to the designated part of the CRT neck.
5. Attach the sensor of the landing adjustment unit on the CRT surface.
6. Adjust the DY position and purity, and the DY tilt, and landing of the center and 4 corners with the landing checker.

Note: Using RV701, 702, 703 and 704 on the L board, adjust the landing of four corners.

<Specifications>
Adjust so that the green is within the specification given right.
Adjust RV within ±1.

(μm)

| | | |
|---|---|---|
| 0 ± 3 | 0 ± 7.5 | 0 ± 3 |
| 0 ± 5 | 0 ± 5 | 0 ± 5 |
| 0 ± 3 | 0 ± 7.5 | 0 ± 3 |

The red and blue must be within the specification given right with respect to the green.

(μm)

| | | |
|---|---|---|
| ± 6 | ± 6 | ± 6 |
| ± 6 | ± 4 | ± 6 |
| ± 6 | ± 6 | ± 6 |

A difference between red and blue must be within the specification given right.

(μm)

| | | |
|---|---|---|
| 10 | 10 | 10 |
| 10 | 7 | 10 |
| 10 | 10 | 10 |

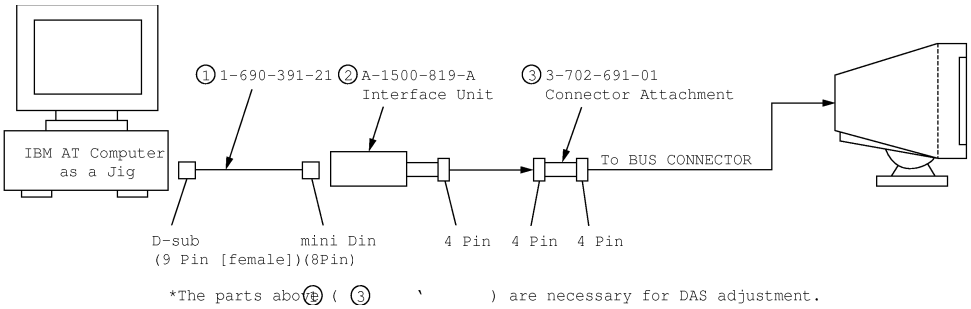
* Adjustment and measurement should be made at the points one inch inside the fluorescent screen.

7. For the up/down and left/right swing, swing the DY and insert a wedge so that the up and down pins are equal at the top and bottom and the horizontal trapezoid is equal at the left and right. Insert the wedge firmly so that the DY does not shake.
8. Check the landing of each corner, and if it does not satisfy the specification, adjust the landing of four corners using RV701, 702, 703 and 704 on the L board. If this adjustment failed, attach the Disk-Mg onto the funnel section and add correction value.

Note:
(1) Do not paste more than 2 magnets to one corner.
(2) Paste within 80 to 100 mm from the DY on the diagonal line of the magnet.
(3) If using the magnet, be sure to demagnetize with the hand degausser and check. (The power must be turned off during chassis degaussing.)

9. Remove the sensor and wobbling coil.
10. Switch the signal to R.G.B., and check that each color is pure.
11. Check that the DY is not tilting, and fix the purity Mg with a white pen.

Connect the communication cable of the computer to the connector located on the D board on the monitor. Run the service software and then follow the instruction.




## • Convergence Rough Adjustment

(1) Receive an image of the white crosshatch signals (white lines on black).
(2) Place the protrusions of the 6-fold poles magnet attached to the CRT neck upon each other.
(3) Make rough adjustment of the H direction convergence by using H. STAT VR (left side of the video block).
(4) Make a rough adjustment of the V direction convergence by using "V. STAT".

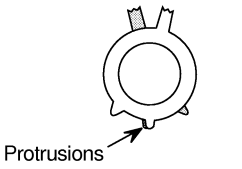



*Fig. 1*

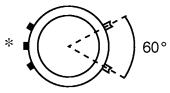



*Fig. 3*

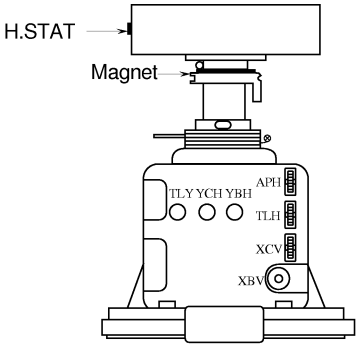
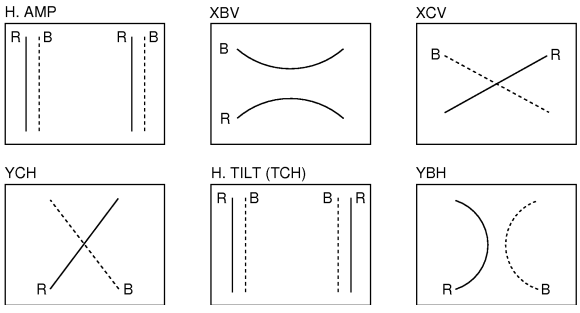
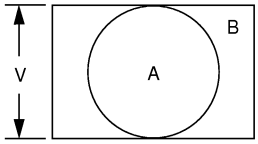



*Fig. 2*

* Set so that the protruding parts of the 2 magnet rings agree with each other.




## • Convergence Specification

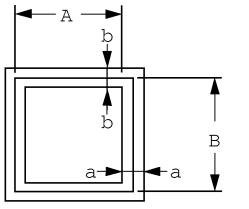



| MODE | 9 | 1, 2, 3, 4, 5, 6, 7, 8, 10 |
|---|---|---|
| A | 0.24 mm | 0.28 mm |
| B | 0.28 mm | 0.32 mm |

## • White Balance Adjustment Specification

(1) 9300K
x = 0.283 ± 0.010
y = 0.298 ± 0.008
(All White)
(2) 6500K
x = 0.313 ± 0.010
y = 0.329 ± 0.008
(All White)
(3) 5000K
x = 0.346 ± 0.008
y = 0.359 ± 0.008
(All White)

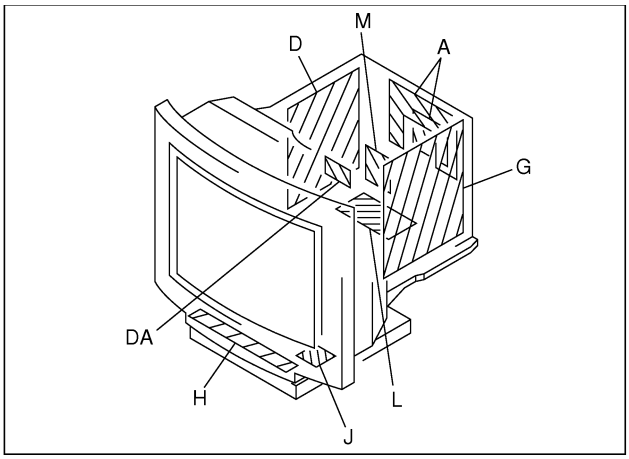
## • Vertical and Horizontal Position and Size Specification




a 3.5 mm
b 3.5 mm

| MODE | 9 | 1-8, 10 |
|---|---|---|
| A | 350 mm | 350 mm |
| B | 280 mm | 280 mm |

## 5-3. CIRCUIT BOARDS LOCATION




## 5-4. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

**Note:**

- All capacitors are in µF unless otherwise noted. pF: µµF 50 V or less are not indicated except for electrolytic.
- Indication of resistance, which does not have one for rating electrical power, is as follows.

  Pitch: 5 mm
  Rating electrical power 1/4 W (CHIP : 1/10 W)

- All resistors are in ohms.
- **f** : nonflammable resistor.
- **F** : fusible resistor.
- △ : internal component.
- **p** : panel designation, and adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- **e** : earth-ground.
- **E** : earth-chassis.
- All voltages are in V.
- Readings are taken with a 10 MΩ digital multimeter.
- Readings are taken with a color-bar signal input.
- Voltage variations may be noted due to normal production tolerances.
- * : Can not be measured.
- Circled numbers are waveform references.
- **S** : B + bus.
- **S** : B – bus.
- When replacing components identified by ], make the necessary adjustments indicated. (See page 14)
- When replacing the part in below table, be sure to perfome the related adjustment.

| | | Part replaced ( ] ) |
|---|---|---|
| HV Regulator Circuit Check | G board | IC901<br>• Mounted G board |
| HV Hold-Down Circuit Check | G board | D935<br>• Mounted G board |
| Beam Current Protector Circuit Check-1 | G board | IC901, D933, D934, R907, R908, R909, R910<br>• Mounted G board |
| Beam Current Protector Circuit Check-2 | G board | R973, R974<br>• Mounted G board |
| Voltage of 3rd winding of FBT | G board | T902 (FBT)<br>• Mounted G board |

**Reference information**

| | | |
|---|---|---|
| RESISTOR | : RN | METAL FILM |
| | : RC | SOLID |
| | : FPRD | NONFLAMMABLE CARBON |
| | : FUSE | NONFLAMMABLE FUSIBLE |
| | : RW | NONFLAMMABLE WIREWOUND |
| | : RS | NONFLAMMABLE METAL OXIDE |
| | : RB | NONFLAMMABLE CEMENT |
| COIL | : LF-8L | MICRO INDUCTOR |
| CAPACITOR | : TA | TANTALUM |
| | : PS | STYROL |
| | : PP | POLYPROPYLENE |
| | : PT | MYLAR |
| | : MPS | METALIZED POLYESTER |
| | : MPP | METALIZED POLYPROPYLENE |
| | : ALB | BIPOLAR |
| | : ALT | HIGH TEMPERATURE |
| | : ALR | HIGH RIPPLE |

**Note: The components identified by shading and mark ¡ are critical for safety. Replace only with part number specified.**

# SECTION 6
# EXPLODED VIEWS

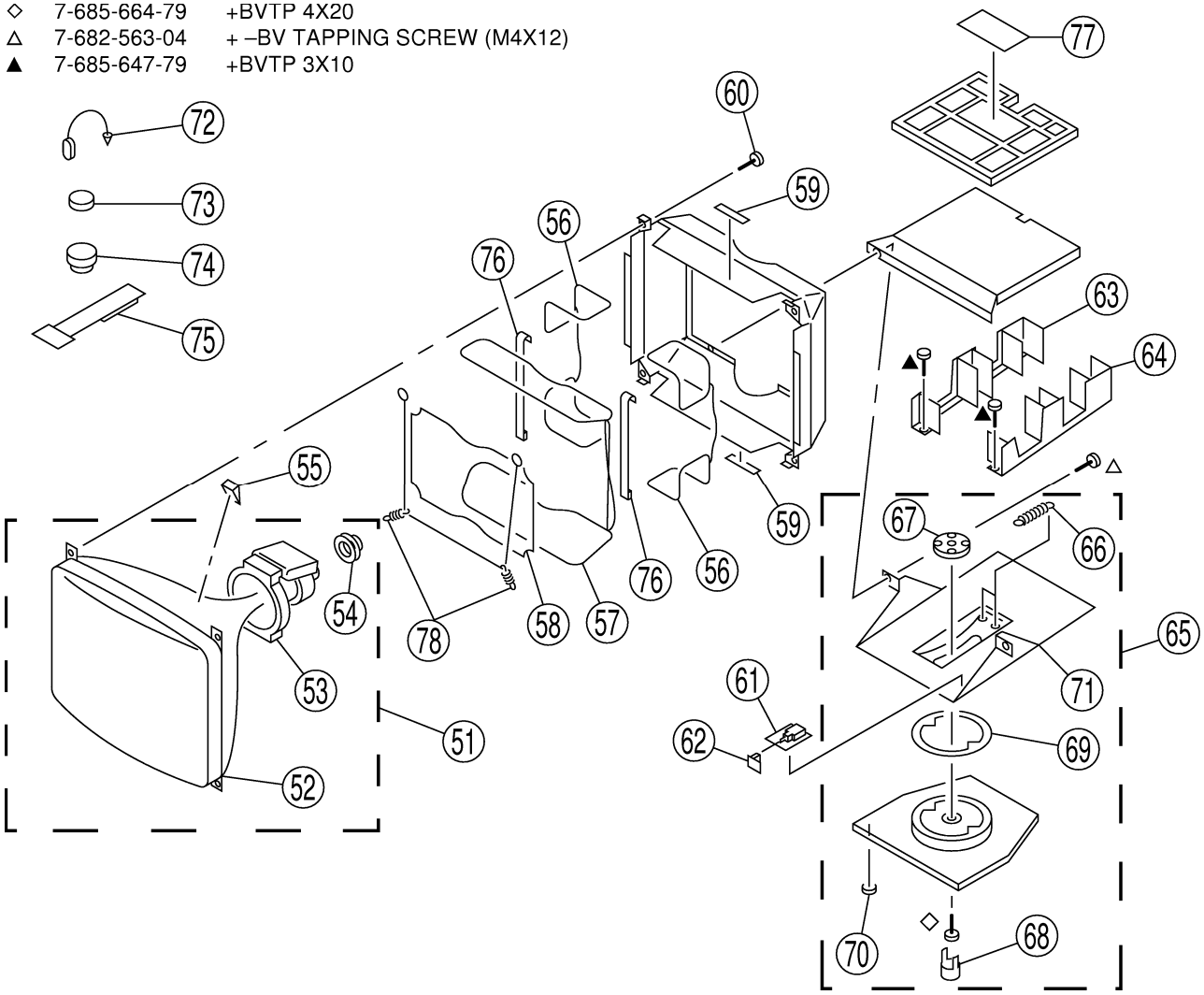
NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

## 6-2. PICTURE TUBE

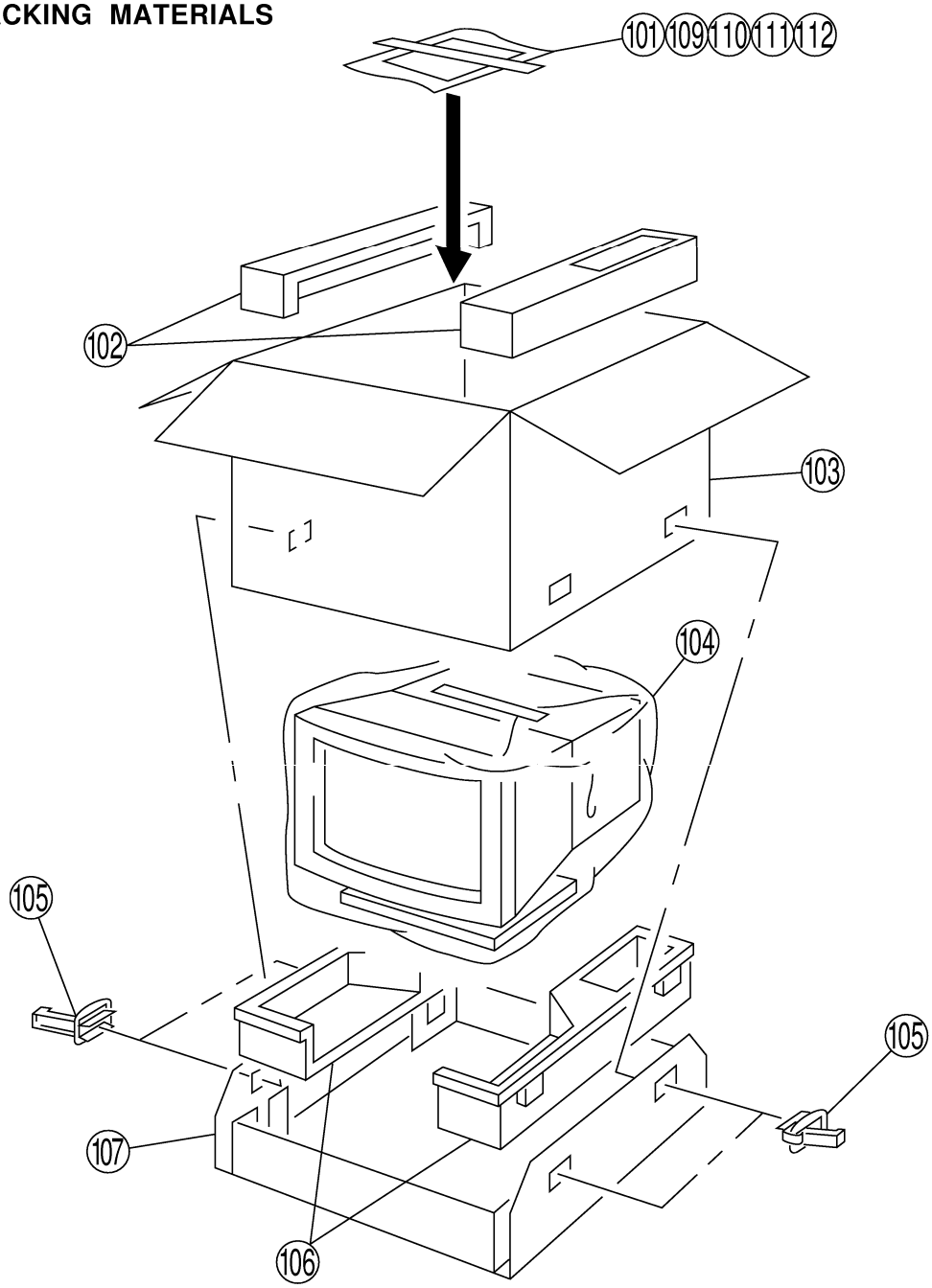
◇ 7-685-664-79 +BVTP 4X20
△ 7-682-563-04 + –BV TAPPING SCREW (M4X12)
▲ 7-685-647-79 +BVTP 3X10




| REF.NO. | | PART NO. | DESCRIPTION | REMARK |
|---|---|---|---|---|
| 51 | ¡ | 8-736-369-94 | ITC ASSY (20SH8-R3) | 52~54 |
| 52 | ¡ | 8-736-389-05 | PICTURE TUBE (20SH8) | |
| 53 | ¡ | 8-451-476-12 | DEFLECTION YOKE (Y20SHK-M) | |
| 54 | ¡ | 8-453-003-41 | NECK ASSY (NA3012-M4) | |
| 55 | | 4-040-897-01 | SPACER, DY | |
| 56 | ¡ | 1-416-140-11 | COIL, LANDING CORRECTION | |
| 57 | ¡ | 1-416-139-11 | COIL, DEMAGINETIC | |
| 58 | ¡ | 1-416-159-11 | COIL, LANDING CORRECTION | |
| 59 | | *9-911-844-99 | CUSHION | |
| 60 | | 4-381-962-11 | SCREW (M4X8), TAPPING, (+–) (BV) | |
| 61 | | *8-933-162-00 | J BOARD, COMPLETE | |
| 62 | | *4-394-972-21 | CAP, POWER | |
| 63 | | *4-051-945-11 | BOTTOM ATTACHMENT (L) | |
| 64 | | *4-051-944-11 | BOTTOM ATTACHMENT (R) | |
| 65 | | X-4033-787-1 | STAND ASSY | 66~71 |
| 66 | | 4-046-901-01 | SPRING, TENSION | |
| 67 | | 4-050-692-01 | STOPPER (A) | |
| 68 | | 4-041-621-01 | STOPPER (B) | |
| 69 | | *4-041-625-01 | RING, TILT SWIVEL | |
| 70 | | 4-047-474-01 | FOOT, RUBBER | |
| 71 | | *4-051-443-71 | COVER, BOTTOM | |
| 72 | | 4-308-870-00 | CLIP, LEAD WIRE | |
| 73 | | 1-452-032-00 | MAGNET, DISC ; 10mmø | |
| 74 | | 1-452-094-00 | MAGNET, ROTATABLE DISK ; 15mmø | |
| 75 | | X-4030-584-1 | PERMALLOY ASSY, CORRECTION | |
| 76 | | *4-057-193-01 | BAND, DEGAUSE COIL | |
| 77 | | *8-933-224-00 | L BOARD, COMPLETE | |
| 78 | | *4-047-316-01 | SPRING, TENSION | |

The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

## 6-3. PACKING MATERIALS




| REF.NO. | PART NO. | DESCRIPTION | REMARK |
|---|---|---|---|
| 101 | 3-858-113-12 | MANUAL, INSTRUCTION | |
| 102 | * 4-051-452-01 | CUSHION (UPPER) (ASSY) | |
| 103 | * 4-055-293-01 | INDIVIDUAL CARTON | |
| 104 | * 4-041-927-31 | BAG, POLY ETHYLENE | |
| 105 | * 4-396-077-01 | JOINT | |
| 106 | * 4-051-453-01 | CUSHION (LOWER) (ASSY) | |
| 107 | * 4-051-450-01 | TRAY | |
| 109 | ¡ 1-765-717-11 | CORD SET, POWER (10A/250V) | |
| 110 | 1-776-210-11 | CABLE ASSY (15P D SUB X2 CONNECTOR) | |
| 111 | 1-774-648-21 | ADAPTOR, CONVERSION (for VGA) | |
| 112 | 4-056-722-01 | MONITOR INFORMATION DISK (WINDOWS 95,3.5") | |

# SECTION 7
# ELECTRICAL PARTS LIST

L

NOTE:

The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

The components identified by [ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

• All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
• All resistors are in ohms
• F : nonflammable

• Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
• CAPACITORS
MF: µF
• COILS
UH: µH

When indicating parts by reference number, please include the board name.

| REF.NO. | PART NO. | DESCRIPTION | | | | REMARK |
|---|---|---|---|---|---|---|
| | *8-933-224-00 | L BOARD, COMPLETE | | | | |
| | | ********** | | | | |
| | | <CAPACITOR> | | | | |
| C701 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C702 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C703 | 1-104-664-11 | ELECT | 47MF | 20% | 25V | |
| C704 | 1-104-664-11 | ELECT | 47MF | 20% | 25V | |
| C705 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C706 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C711 | 1-104-664-11 | ELECT | 47MF | 20% | 25V | |
| C712 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C713 | 1-104-664-11 | ELECT | 47MF | 20% | 25V | |
| C714 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1701 | 1-117-722-91 | ELECT | 2200MF | 20% | 10V | |
| C1703 | 1-126-933-11 | ELECT | 100MF | 20% | 16V | |
| C1704 | 1-126-933-11 | ELECT | 100MF | 20% | 16V | |
| C1705 | 1-126-933-11 | ELECT | 100MF | 20% | 16V | |
| C1706 | 1-126-933-11 | ELECT | 100MF | 20% | 16V | |
| C1707 | 1-104-664-11 | ELECT | 47MF | 20% | 25V | |
| C1708 | 1-104-664-11 | ELECT | 47MF | 20% | 25V | |
| C1710 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1711 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1712 | 1-137-399-11 | FILM | 0.1MF | 5% | 50V | |
| C1713 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1720 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1721 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1722 | 1-137-399-11 | FILM | 0.1MF | 5% | 50V | |
| C1723 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1730 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1731 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1732 | 1-137-399-11 | FILM | 0.1MF | 5% | 50V | |
| C1733 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1737 | 1-104-664-11 | ELECT | 47MF | 20% | 25V | |
| C1738 | 1-104-664-11 | ELECT | 47MF | 20% | 25V | |
| C1740 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1741 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1742 | 1-137-399-11 | FILM | 0.1MF | 5% | 50V | |
| C1743 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1750 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1751 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1752 | 1-137-399-11 | FILM | 0.1MF | 5% | 50V | |
| C1753 | 1-164-004-11 | CERAMIC CHIP | 0.1MF | 10% | 25V | |
| C1757 | 1-104-664-11 | ELECT | 47MF | 20% | 25V | |
| C1758 | 1-104-664-11 | ELECT | 47MF | 20% | 25V | |
| | | <CONNECTOR> | | | | |
| CN701* | 1-564-514-11 | PLUG, CONNECTOR 11P | | | | |
| CN702* | 1-564-513-11 | PLUG, CONNECTOR 10P | | | | |
| CN703* | 1-564-506-11 | PLUG, CONNECTOR 3P | | | | |
| | | <DIODE> | | | | |
| D701 | 8-719-800-76 | DIODE 1SS226 | | | | |
| D702 | 8-719-800-76 | DIODE 1SS226 | | | | |
| D703 | 8-719-800-76 | DIODE 1SS226 | | | | |
| D704 | 8-719-800-76 | DIODE 1SS226 | | | | |
| D705 | 8-719-404-49 | DIODE MA111 | | | | |
| D706 | 8-719-976-99 | ZENER DIODE DTZ5.1B | | | | |
| D1701 | 8-719-404-49 | DIODE MA111 | | | | |
| D1702 | 8-719-404-49 | DIODE MA111 | | | | |
| D1710 | 8-719-800-76 | DIODE 1SS226 | | | | |
| D1720 | 8-719-800-76 | DIODE 1SS226 | | | | |
| D1730 | 8-719-800-76 | DIODE 1SS226 | | | | |
| D1740 | 8-719-800-76 | DIODE 1SS226 | | | | |
| D1750 | 8-719-800-76 | DIODE 1SS226 | | | | |
| | | <IC> | | | | |
| IC701 | 8-759-100-96 | IC UPC4558G2 | | | | |
| IC702 | 8-759-100-96 | IC UPC4558G2 | | | | |
| IC703 | 8-759-708-05 | IC NJM78L05A | | | | |
| IC705 | 8-759-008-67 | IC MC14066BF | | | | |
| IC1701 | 8-759-100-96 | IC UPC4558G2 | | | | |
| IC1702 | 1-475-090-11 | SENSOR UNIT, MAGNETIC | | | | |
| IC1703 | 8-759-981-48 | IC TL082M | | | | |
| IC1710 | 8-759-822-38 | IC LA6510 | | | | |
| IC1730 | 8-759-822-38 | IC LA6510 | | | | |
| IC1750 | 8-759-803-42 | IC LA6500-FA | | | | |
| | | <TRANSISTOR> | | | | |
| Q702 | 8-729-027-52 | TRANSISTOR DTC124EKA-T146 | | | | |

# L

| REF.NO. | PART NO. | DESCRIPTION | | | REMARK |
|---|---|---|---|---|---|
| Q703 | 8-729-027-52 | TRANSISTOR DTC124EKA-T146 | | | |
| | | <RESISTOR> | | | |
| R751 | 1-216-081-00 | METAL GLAZE 22K | 5% | 1/10W | |
| R752 | 1-216-081-00 | METAL GLAZE 22K | 5% | 1/10W | |
| R753 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R754 | 1-216-095-00 | METAL GLAZE 82K | 5% | 1/10W | |
| R755 | 1-216-075-00 | METAL GLAZE 12K | 5% | 1/10W | |
| R756 | 1-216-097-91 | METAL GLAZE 100K | 5% | 1/10W | |
| R757 | 1-216-067-00 | METAL GLAZE 5.6K | 5% | 1/10W | |
| R758 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R759 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R760 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R761 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R762 | 1-216-081-00 | METAL GLAZE 22K | 5% | 1/10W | |
| R763 | 1-216-081-00 | METAL GLAZE 22K | 5% | 1/10W | |
| R764 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R765 | 1-216-095-00 | METAL GLAZE 82K | 5% | 1/10W | |
| R766 | 1-216-075-00 | METAL GLAZE 12K | 5% | 1/10W | |
| R767 | 1-216-097-91 | METAL GLAZE 100K | 5% | 1/10W | |
| R768 | 1-216-065-00 | METAL GLAZE 4.7K | 5% | 1/10W | |
| R769 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R770 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R771 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R772 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R773 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R774 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R775 | 1-216-295-91 | CONDUCTOR, CHIP | | | |
| R776 | 1-216-295-91 | CONDUCTOR, CHIP | | | |
| R777 | 1-216-295-91 | CONDUCTOR, CHIP | | | |
| R778 | 1-216-295-91 | CONDUCTOR, CHIP | | | |
| R779 | 1-216-053-00 | METAL GLAZE 1.5K | 5% | 1/10W | |
| R780 | 1-216-061-00 | METAL GLAZE 3.3K | 5% | 1/10W | |
| R781 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R782 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R784 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R785 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R787 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R789 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R790 | 1-216-097-91 | METAL GLAZE 100K | 5% | 1/10W | |
| R791 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R792 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R793 | 1-216-097-91 | METAL GLAZE 100K | 5% | 1/10W | |
| R794 | 1-216-053-00 | METAL GLAZE 1.5K | 5% | 1/10W | |
| R795 | 1-216-057-00 | METAL GLAZE 2.2K | 5% | 1/10W | |
| R796 | 1-216-057-00 | METAL GLAZE 2.2K | 5% | 1/10W | |
| R797 | 1-216-085-00 | METAL GLAZE 33K | 5% | 1/10W | |
| R798 | 1-216-041-00 | METAL GLAZE 470 | 5% | 1/10W | |
| R1701 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R1702 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R1703 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R1704 | 1-216-125-00 | METAL GLAZE 1.5M | 5% | 1/10W | |
| R1705 | 1-216-049-91 | METAL GLAZE 1K | 5% | 1/10W | |
| R1706 | 1-216-081-00 | METAL GLAZE 22K | 5% | 1/10W | |
| R1707 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R1708 | 1-216-081-00 | METAL GLAZE 22K | 5% | 1/10W | |
| R1710 | 1-216-067-00 | METAL GLAZE 5.6K | 5% | 1/10W | |
| R1711 | 1-249-441-11 | CARBON 100K | 5% | 1/4W | F |
| R1712 | 1-215-859-00 | METAL OXIDE 22 | 5% | 1W | F |
| R1713 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R1714 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R1715 | 1-216-308-00 | METAL GLAZE 4.7 | 5% | 1/10W | |
| R1716 | 1-216-308-00 | METAL GLAZE 4.7 | 5% | 1/10W | |
| R1717 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R1718 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R1720 | 1-216-067-00 | METAL GLAZE 5.6K | 5% | 1/10W | |
| R1721 | 1-249-441-11 | CARBON 100K | 5% | 1/4W | F |
| R1722 | 1-215-859-00 | METAL OXIDE 22 | 5% | 1W | F |
| R1723 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R1724 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R1725 | 1-216-308-00 | METAL GLAZE 4.7 | 5% | 1/10W | |
| R1726 | 1-216-308-00 | METAL GLAZE 4.7 | 5% | 1/10W | |
| R1730 | 1-216-067-00 | METAL GLAZE 5.6K | 5% | 1/10W | |
| R1731 | 1-249-441-11 | CARBON 100K | 5% | 1/4W | F |
| R1732 | 1-215-859-00 | METAL OXIDE 22 | 5% | 1W | F |
| R1733 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R1734 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R1735 | 1-216-308-00 | METAL GLAZE 4.7 | 5% | 1/10W | |
| R1736 | 1-216-308-00 | METAL GLAZE 4.7 | 5% | 1/10W | |
| R1737 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R1738 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R1740 | 1-216-067-00 | METAL GLAZE 5.6K | 5% | 1/10W | |
| R1741 | 1-249-441-11 | CARBON 100K | 5% | 1/4W | F |
| R1742 | 1-215-859-00 | METAL OXIDE 22 | 5% | 1W | F |
| R1743 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R1744 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R1745 | 1-216-308-00 | METAL GLAZE 4.7 | 5% | 1/10W | |
| R1746 | 1-216-308-00 | METAL GLAZE 4.7 | 5% | 1/10W | |
| R1750 | 1-216-063-91 | METAL GLAZE 3.9K | 5% | 1/10W | |
| R1751 | 1-249-441-11 | CARBON 100K | 5% | 1/4W | F |
| R1752 | 1-215-859-00 | METAL OXIDE 22 | 5% | 1W | F |
| R1753 | 1-216-073-00 | METAL GLAZE 10K | 5% | 1/10W | |
| R1754 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R1757 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R1758 | 1-249-383-11 | CARBON 1.5 | 5% | 1/4W | F |
| R1771 | 1-216-099-00 | METAL GLAZE 120K | 5% | 1/10W | |
| R1772 | 1-216-099-00 | METAL GLAZE 120K | 5% | 1/10W | |
| R1773 | 1-216-099-00 | METAL GLAZE 120K | 5% | 1/10W | |
| R1774 | 1-216-097-91 | METAL GLAZE 100K | 5% | 1/10W | |
| R1775 | 1-216-041-00 | METAL GLAZE 470 | 5% | 1/10W | |
| R1776 | 1-247-855-31 | CARBON 10K | 5% | 1/4W | |
| R1777 | 1-249-417-11 | CARBON 1K | 5% | 1/4W | |
| | | <VARIABLE RESISTOR> | | | |
| RV701 | 1-241-630-11 | RES, ADJ, CARBON 10K (LT) | | | |
| RV702 | 1-241-630-11 | RES, ADJ, CARBON 10K (RT) | | | |
| RV703 | 1-241-630-11 | RES, ADJ, CARBON 10K (LB) | | | |
| RV704 | 1-241-630-11 | RES, ADJ, CARBON 10K (RB) | | | |

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The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

| REF.NO. | | PART NO. | DESCRIPTION | REMARK |
|---|---|---|---|---|
| | | | MISCELLANEOUS | |
| | | | ********** | |
| | ¡ | 1-251-382-12 | INLET, AC 3P(WITH NOISE FILTE) | |
| | ¡ | 1-416-139-11 | COIL, DEGAUSS | |
| | ¡ | 1-416-140-11 | COIL, LANDING CORRECTION | |
| | ¡ | 1-416-159-11 | COIL, LANDING CORRECTION | |
| | | 1-694-108-11 | TERMINAL BOARD ASSY, I/O | |
| | ¡ | 1-765-717-11 | CORD SET, POWER (120A/250V) | |
| | | 1-774-648-21 | ADAPTOR, CONVERSION (for VGA) | |
| | | 1-776-210-11 | CABLE ASSY | |
| | | | | (15P DSUB X2 CONNECTOR) |
| | | 1-900-215-90 | CONNECTOR ASSY | |
| | ¡ | 8-451-476-12 | DEFLECTION YOKE (Y20SHK-M) | |
| | ¡ | 8-453-003-41 | NECK ASSY (NA3012-M4) | |
| V901 | ¡ | 8-736-389-05 | PICTURE TUBE (20SH8) | |
| | ¡ | 8-736-369-94 | ITC ASSY (20SH8-R3) | |